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FY 1992 BUDGET REQUEST FOR THE DOE's ENVIRONMENT, SAFETY, AND HEALTH PROGRAM

HEARING BEFORE THE SUBCOMMITTEE ON ENVIRONMENT OF THE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY U.S. HOUSE OF REPRESENTATIVES ONE HUNDRED SECOND CONGRESS

FIRST SESSION

MARCH 7, 1991

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FY 1992 BUDGET REQUEST FOR DOE's ENVIRONMENT, SAFETY, AND HEALTH PROGRAM

THURSDAY, MARCH 7, 1991

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
SUBCOMMITTEE ON ENVIRONMENT,
Washington, D.C.

The subcommittee met, pursuant to notice, at 1:07 p.m., in room 2325, Rayburn House Office Building, the Honorable James H. Scheuer [chairman of the subcommittee] presiding.

Mr. WOLPE. The hearing will come to order.

I am not Jim Scheuer. He is on his way, but in order to expedite the proceedings, we will get started at this point.

Today we will consider the President's fiscal year 1992 budget request for the Department of Energy's Environment, Safety, and Health Program.

Since the Office of Environment, Safety, and Health was established by the Secretary of Energy in 1985, it has faced the difficult challenge of acting as the watchdog for an institution not accustomed to oversight. The DOE weapons production culture was one of secrecy and environmental recklessness, where the paramount goal to manufacture the nuclear arsenal overrode all other considerations.

A large institution grew around this concept and this mentality went unchallenged until 1984 when a Tennessee court decided that DOE's facilities were indeed subject to the same hazardous waste laws as any other U.S. factory would be. The Department is now cooperating with Federal, State, and local governmental agencies to bring its facilities into compliance with environmental and safety statutes.

Moreover, in 1989 the Admiral instituted a Ten Point Plan for organizational and functional changes to strengthen DOE's self regulation capabilities in the areas of environment, safety, and health.

Progress has been made: cadres of environmental auditors known as "Tiger Teams" routinely swoop down on major DOE facilities to catalog environmental and safety infractions, and prepare reports based on their findings; a line management system has been installed to ensure that problems are reported up the line, and solutions are directed back down the line; and research to assess the health impact of past occupational exposures to DOE workers is being conducted in conjunction with the Department of Health and Human Services. But there is still a long way to go.

Contamination from chemical and radioactive waste may be reaching communities surrounding DOE facilities, and there is currently no good system in place for measuring it. Thousands of safety and environmental regulations have been recorded, yet the Department lacks a system for recording how and when these violations are rectified. And the price tag for cleanup, often quoted at upwards of \$150 billion, may be much too low. We simply don't know because we haven't adequately characterized contamination and we don't yet have all the technologies we need to clean up sites.

The members of the Subcommittee are eager to hear our distinguished witnesses present their views on how to meet this most difficult challenge: cleaning up the mess caused by past practices while continuing important operations at DOE facilities in a way that protects human health and the environment.

I encourage the witnesses to tell us specifically: what can be done, from a policy as well as a budget perspective, to improve the efficiency of the ES&H Office, DOE's internal watchdog; and if there is a need for increased oversight from outside the Department for these activities.

I yield at this point to my distinguished colleague, the gentleman from Pennsylvania, the ranking minority member of the Community—of the Committee, Mr. Ritter, for his opening statement.

Mr. RITTER. I like that "ranking minority member of the Community". That was good. It makes it seem as though we're responsible for a wider horizon of things.

Thank you, Mr. Chairman. It is a pleasure to join you working on this Subcommittee and our Chairman, Jim Scheuer. This is a new subcommittee for me. Under the leadership of the Chairman, this Subcommittee has moved forward on a broad range of issues at the forefront of national concern. Our challenge now is to ensure that good science precedes and works in tandem with good regulations to protect the environment. That is an overriding interest of mine, to see that the kind of regulatory programs we set out to achieve are based on the best possible science. I think we will get the best possible cleanup of the environment if we do that, and we will use our resources most efficiently. So I look forward to working with you, Mr. Wolpe, in the months ahead.

It is fortuitous that the Subcommittee turns first to a review of the Department of Energy's Environment, Safety, and Health Program. ES&H has a responsibility to oversee environmental and safety activities at DOE's facilities. DOE intends to spend billions of dollars in remediating existing conditions at the weapons sites, and ES&H has a pivotal role to play in assessing how that money is spent.

I would like to just inject here that another strong interest of mine is Total Quality Management. If you might be able to comment on how DOE is pursuing concepts of Quality, I would be interested. Perhaps a new program like this is prime, fertile ground for doing some of these things in the Federal Government.

The ES&H program is only 5 years old, and is just beginning to sink its teeth into some of the thorniest environmental issues. It has recently been reorganized to reflect an upgraded mission. Ad-

miral Watkins has demonstrated his own concern for these issues, and has backed up his concern with some very specific actions.

Some are questioning whether the Department has done all that it can, but it appears that you have started to move in the right direction.

I look forward to a comprehensive discussion of the program. I welcome our distinguished witnesses today and look forward to their input.

Mr. Chairman, before you arrived, I stated how pleased and honored I was to serve as your Ranking Republican and to work with you on these issues of such importance to America and the environment.

I yield back the balance of my time.

Mr. SCHEUER. Thank you very much, Mr. Ritter. We're very happy to have a man of your talent and wisdom and experience serving as the ranking minority member. And I'm sure we'll have a very successful and productive 102nd Congress. I'm delighted to work with you.

Congressman Swett?

Mr. SWETT. Thank you, Mr. Chairman.

I have no opening statement and I look forward to the testimony this afternoon.

Mr. SCHEUER. Congressman Wolpe, do you have a statement of your own?

Mr. WOLPE. No, I look forward to hearing all these witnesses.

Mr. SCHEUER. Okay, then we'll go right to the witnesses.

Mrs. MORELLA. Mr. Chairman?

Mr. SCHEUER. I'm sorry. Congresswoman Morella, I'm sorry.

Mrs. MORELLA. You know how to surreptitiously get into a room and not be seen.

Mr. SCHEUER. That purple color of yours is just so unobtrusive. [Laughter.]

Mrs. MORELLA. I know.

I would like to make a brief opening statement, if I might. I commend you also on the hearing today.

Mr. Chairman, last night's joint session of Congress vibrated with joy and pride in a mission accomplished, a job well done.

Mr. SCHEUER. And you vibrated with joy and pride over the television screens of America, I might add.

Mrs. MORELLA. This locality is where I live and represent a lot of Members of Congress, as a matter of fact, like Congressman Wolpe.

Today, we get down to work on the very important, but sometimes not too exciting, matter of the fiscal year 1992 proposed budget for the Department of Energy's Environment, Safety, and Health Program. The ES&H program exercises a critical role in its oversight responsibilities to the environment, safety, and health activities of facility operations, environmental cleanups, and waste management. Since the program's establishment in 1986, Secretary Watkins has worked to improve the effectiveness of the ES&H program through the Ten Point Plan that was announced in June, 1989, which established independent Tiger Teams to make environment, safety, and health assessments at nuclear weapons sites.

I have some concerns which I know will be addressed in today's hearing. The Office of Technology Assessment's report, "Complex

Cleanup," details problems that we must deal with. Which sites in the DOE's nuclear weapons complex should be cleaned up first? What cleanup technologies could best do the job? Is the ES&H program attracting and keeping trained personnel for the activities for which these offices are responsible, or are they leaving for other things? Is DOE able to conduct adequate oversight of the environmental management and waste management program?

I look forward, Mr. Chairman, to hearing from our knowledgeable witnesses on the Department of Energy's Environment, Safety, and Health Program. There are some grave problems which we all want to resolve in a responsible manner. I know our witnesses will provide very important insight into the issues involved. I thank them for appearing here today before our Subcommittee.

I thank you for the courtesy of the time, Mr. Chairman.

Mr. SCHEUER. Thank you very much, Congresswoman Morella.

All right, we'll start off with the witnesses. Dr. Paul Ziemer has served as Assistant Secretary of Energy for Environment, Safety, and Health since August 4th of last year. He came to the Department of Energy from Purdue University where he had been head of the School of Health Sciences since 1983. He is responsible for overseeing all radiological and non-nuclear safety and health activities as well as compliance with applicable laws relative to environmental protection and worker safety.

We're very happy to have you, Dr. Ziemer. Please proceed. We have four panels today so we'll ask all the witnesses to stick as close to 5 minutes as they can.

Would you please proceed?

STATEMENT OF DR. PAUL L. ZIEMER, ASSISTANT SECRETARY, ENVIRONMENT, SAFETY, AND HEALTH, DEPARTMENT OF ENERGY, WASHINGTON, D.C.; ACCOMPANIED BY: RAYMOND P. BERUBE, DEPUTY ASSISTANT SECRETARY FOR ENVIRONMENT

Dr. ZIEMER. Thank you very much, Mr. Chairman. Might I say that I appreciate the sentiments and the encouragement reflected by the remarks of the members of the Subcommittee in their opening remarks.

I'm pleased to be here today to discuss issues of our fiscal year 1992 budget. My formal remarks of course have been submitted for the record in detail, but today I would really like to focus on the three issues which the Chairman suggested that I address in his invitation letter to me. Those issues being: what are the achievements of ES&H this past year with respect to worker health and safety; the second issue was the issue of the degree to which our staffing is able to meet our current commitments, the issue also raised in the opening comments; and the third issue is that of our relationship to the Environmental Restoration and Waste Management program—what is the interaction or the play between our group, Environment, Safety, and Health oversight, and the program involved in environmental restoration and waste management?

I regard the function of my office, Environment, Safety, and Health, as being one really of oversight and for providing for Secre-

tary Watkins an independent view of how well our facilities are doing in the areas of environment, safety, and health.

The principal task of oversight, as it has emerged under Secretary Watkins, of the independent oversight, is one that is becoming more and more directed toward assessing how well our line management is also doing the job of oversight within the line organizations. Because we feel that the line management, the line organizations, are wholly responsible and accountable for environmental protection, for safety, and health as well as security within our DOE system. So our focus is becoming more and more on making sure that line is carrying out their task in this regard.

Several of you mentioned the Secretary's Ten Point Plan in your opening remarks, and that certainly has been the guideline that has directed our focus in the past year.

I would like to focus on two main issues here today with respect to health and safety. At this particular hearing about a year ago, you heard from Kristine Gebbie, who chaired the Secretarial Panel for the Evaluation of Epidemiological Research for the Department of Energy. She reported at that time on the recommendations of the panel. You will recall that at that time there were a number of initiatives set forth by Secretary Watkins. Those initiatives got underway then just about a year ago at this time. Many of those have certain time lines for being accomplished.

I would like to give you a brief update in my oral remarks here where we are relative to that SPEERA panel and their recommendations. Let me mention three of their more salient recommendations. There were a number, as you recall.

One of the recommendations was that the Department of Energy consolidate its health-related activities into one office. Another important one had to do with the issue of transferring the long-term—or what are called analytical epidemiological studies—from the DOE to the Department of Health and Human Services. And then a third important issue was that of bringing about greater focus on worker health surveillance and involving the participation of the public in that process.

With respect to those three issues, I can tell you today that first of all the Office of Health is in place. That occurred organizationally during the summer and early fall. We have now in place the Deputy Assistant Secretary for Health, Doctor Harry Pettengill. He has three divisions. Two of his divisions—the office directors have been selected and appointed. A third one, that of occupational medicine—we are in the interview process there and we expect to have that filled very shortly. That position will be an M.D. But we're making good progress not only organizationally but in the staffing of the office.

Secondly, with respect to health issues, the epidemiology program in the Department has been restructured to reflect the recommendations of the SPEERA panel and our office now has overall responsibility for the epidemiological program. In that connection, the long-term, or analytical epidemiological studies, have been transferred to the Department of Health and Human Services—or I should say are being transferred through a memorandum of understanding which was completed on December 24th of this past

year and is now being implemented. So that transition is already occurring and is underway.

The memorandum of understanding—we won't go through that in great detail here—but I would like to very quickly mention to you that under that memorandum the Department of Health and Human Services will have responsibility for the oversight of these analytical epidemiological studies for the Department of Energy. Initially, that will involve overseeing the ongoing studies which are currently underway within the Department. This will gradually transfer—or rather transition—to the full oversight by that group in terms of a regular independent type of process whereby they will seek and solicit proposals. The whole process will be completely under their purview.

DOE will retain an input to that process through the memorandum of understanding whereby we will have input on the research agenda because we want to assure that those issues that are important to the DOE and which are important to our oversight committees are reflected in the research agenda of Health and Human Services.

Let me also briefly mention the area of worker safety, particularly occupational safety that relates to what is frequently known as the OSHA type of safety issues.

This past year, Secretary Watkins requested the Department of Labor and then Secretary Dole to provide us with assistance in assessing how our occupational safety program in the Department was doing. The Department of Labor agreed to do that and they provided an assessment team which selected a number of DOE facilities and visited those facilities with regular OSHA-type teams and made OSHA-type inspections. They have prepared a report critiquing our OSHA stature and how well they think we are able to conduct and carry out and meet our responsibilities with respect to occupational safety and health.

I might add that the official report from the Department of Labor has not been received by us at this point. We expect it to arrive within a week. We have, however, seen draft reports and are aware of their findings and are already positioning ourselves to respond positively to the recommendations we expect them to make very shortly.

I can go into details later, if you wish, on the nature of that assessment, but let me leave it at that at this point and simply make a couple other remarks relative to issues that were raised in the opening remarks here, one having to do with personnel. Are we losing, are we gaining? Let me tell you where we are now.

We have about 225 FTEs on board in Environment, Safety, and Health, which is a good number for us. We are expanding. We are having a net increase in the past 6 months. We expect that to continue to grow. We would—

Mr. SCHEUER. Excuse me, Dr. Ziemer, just for the record, an FTE is a full time—

Dr. ZIEMER. Full time equivalent. I'm sorry. Thank you.

Full time equivalents. Most of those are in fact full time and not combinations of part time, but in the way they are evaluated.

We would expect that to grow in the next 6 months by approximately I would say 30 to 40, if we're successful in the hiring. These

are largely technical positions we're trying to hire. We've been largely successful, I think in part because we have a good cadre of well qualified people. One of the ways in which you hire people—and its not just money. If it was only that we would have great, great difficulty—but quality people attract other quality people. We are developing a good cadre of excellent technical people.

That's ongoing, and I expect us to be by next year probably at a strength of about 260—somewhere in that range. We'll see beyond that where we will get, but we are in fact increasing, and I'm very optimistic about that.

Finally, very briefly let me mention the interactions or the relationship between the office represented by my colleague, Dr. Frank, and our own responsibilities in ES&H.

Our program, which is an oversight group, is very much involved in supporting every aspect of what environmental restoration is involved in. We are involved, for example, in their 5-year planning process. In the initial rounds of that, the initial Five Year Plan, and the one that's current, our folks were very much involved in the assistance and support mode. We expect to move to more of an oversight mode in future additions as this office now is staffed up and is quite functional and has on their own staff of people who can do some of the things that we were initially involved in supporting.

We have full involvement in the NEPA oversight process of all the activities that that group does. We're involved very centrally in the negotiations and cleanup agreements, compliance monitoring agreements, that involve that group and outside agencies. We conduct regularly the environmental compliance audits of all the sites and locations where there are activities occurring as well as other safety and health oversight responsibilities.

So, briefly, we are very much involved actively on a day- to-day basis with their operations.

That concludes my oral remarks, Mr. Chairman, and I would be pleased to answer questions.

[The prepared statement of Dr. Ziemer follows:]

Statement of

Paul L. Ziemer, Ph.D.

Assistant Secretary
Environment, Safety and Health
U.S. Department of Energy

Before the

Subcommittee on Environment
House Science, Space and Technology Committee

March 7, 1991

Mr. Chairman and members of the Subcommittee, I am pleased to be here today to discuss the Department of Energy's (DOE) FY 1992 budget request for the Office of Environment, Safety and Health.

Protection of the environment, the safety and security of our facilities, and the health of workers and the public are top priorities of Secretary Watkins. A management structure has been put into place to provide internal environment, safety, health and security oversight by Department of Energy line managers on a day-to-day, shift-by-shift basis, buttressed by continuing and frequent external and internal independent oversight. Line management must be held wholly accountable for environmental protection, safety, health and security. The principal task of independent oversight must be to promote the achievement of environmental protection, safety, health and security requirements by line management.

The Office of Environment, Safety and Health (EH) is the Secretary's principal advisor on environmental protection, radiological and non-radiological safety, and occupational and public health. The office also manages the Security Evaluation oversight program which was formerly in Defense Programs. In carrying out its mission, EH seeks to establish DOE as the preeminent Federal agency in protecting the health, safety, and

security of our workers and the public, and protecting the environment. To this end, EH verifies, validates, and assesses compliance with applicable laws, regulations, rules and standards; promotes understanding of environmental, safety, health and security requirements; develops and recommends policies; manages health studies; certifies transportation packages and approves National Environmental Policy Act (NEPA) documents.

In response to the Secretary's 10-Point Plan, issued in June 1989, a number of significant management reforms have been implemented over the past year.

- Created an Office of Health to carry out a comprehensive occupational health program and strengthen oversight of the occupational medical programs of the Department's contractors.
- Restructured the Department's epidemiology program to implement the recommendations of the independent Secretarial Panel for the Evaluation of Epidemiologic Research Activities, and installed a comprehensive epidemiologic data repository, containing data on approximately 70,000 workers. In addition, a Memorandum of Understanding has been signed with the Department of Health and Human Services (HHS), under which the management of long-term epidemiologic studies will be conducted by HHS.

- Continued Tiger Team assessments to review environment, safety and health programs at DOE facilities to determine the extent and nature of corrective actions needed.
- Improved coordination with the Occupational Safety and Health Administration (OSHA) which has provided DOE with assistance on three Tiger Teams, conducted extensive training of DOE staff, and carried out an evaluation of DOE's occupational safety and health program.
- Revised the Department's NEPA procedures to improve compliance with NEPA requirements.
- Revised the contractor award fee structure to emphasize performance in environment, safety and health, and to establish an advisory role for the Assistant Secretary for Environment, Safety and Health.
- Established a Safeguards and Security Task Force to conduct a comprehensive review of the state of safeguards and security at DOE facilities. The Task Force issued its report December 20, 1990, and action on all recommendations contained in the report is anticipated prior to October 1991.

PLANNED FY 1991 ACCOMPLISHMENTS

In response to the Secretary's 10-Point Plan, the Office of Environment, Safety and Health will continue to focus on a number of priority efforts.

Tiger Team Assessments will continue to review environment, safety and health programs at DOE facilities to determine the extent and nature of corrective actions needed. As of December 1990, Tiger Team assessments have been completed at 18 major operating facilities. These assessments are followed up with "Action Plans" outlining the course of action which DOE follows to resolve basic deficiencies noted in the assessments. Final action plans have been approved for 12 facilities.

National Environmental Policy Act (NEPA) policy has been revised and strengthened to ensure it is an integral part of the decision making process with full disclosure of environmental impacts and expanded public involvement. During FY 1991, the new NEPA policy is being formalized through rulemaking.

Health initiatives, begun last summer, will receive priority attention in FY 1991. As part of his 10-Point Plan, Secretary Watkins established in August 1989 the Secretarial Panel for the Evaluation of Epidemiologic Research Activities (SPEERA) to review the appropriateness, effectiveness, and overall quality of the

Department of Energy epidemiologic research activities. SPEERA, in its final report issued in March 1990, made a number of significant recommendations affecting all DOE sites:

- The consolidation of all DOE health activities and resources into an Office of Health within DOE.
- The transfer of long-term analytic health studies to the Department of Health and Human Services (HHS) under a Memorandum of Understanding (MOU) with DOE.
- A much greater focus on worker health surveillance and on worker and public participation in the planning of future health studies.

The new Office of Health has been established and is carrying out numerous initiatives that are responsive to these recommendations. Of particular note is the MOU with the Department of Health and Human Services.

SPEERA noted that "there has been a lack of credibility in the Department's epidemiologic activities" expressed by witnesses at its public meetings. Thus, the Panel stated that, "to restore public trust, to assure the highest scientific quality, and to assure the independence of investigators, the Department needs an independent system for managing its analytic epidemiologic

research."

The MOU with the Department of Health and Human Services, signed in December, 1990, sets forth the guidelines for coordination between DOE and HHS to carry out the recommendations of SPEERA for the management of DOE analytic epidemiologic research by HHS. This includes the resources for the design, implementation, analysis, and interpretation of analytic epidemiologic data of the following populations: workers at DOE facilities; residents of communities in the vicinity of DOE facilities; other persons exposed to radiation; and persons exposed to potential hazards resulting from non-nuclear energy production and use.

Highlights of the MOU include:

- Long-term epidemiologic studies supported by DOE will be continued under the HHS regular monitoring process as we make the transition to a competitive system for grants and contracts.
- DOE will participate in the yearly development of the proposed HHS research agenda for analytic epidemiologic studies by having DOE representatives serve as non-voting members on an HHS Advisory Committee.
- DOE reserves the right to carry out, independent of HHS, any

analytic research projects DOE deems necessary, but which are declined by HHS.

- DOE will provide the committee with a list of proposed research projects each year for consideration during the appropriation process.

Worker safety will continue as a top priority of the Department during FY 1991. Activities begun last year through an agreement with the Occupational Safety and Health Administration (OSHA) are producing results:

- At the Secretary's request OSHA has just completed a review of DOE's contractor worker safety programs that resulted in recommendations for improvement.
- In the past year, over one hundred DOE and DOE Contractor employees have received training at the OSHA training facility.
- EH, with OSHA assistance, is developing its own occupational safety training programs for DOE managers and contractor employees. We have several pilot courses being taught by retired OSHA instructors, with additional courses coming on line during FY 1991.

FY 1992 BUDGET REQUEST

The FY 1992 budget request for the Environment, Safety and Health program is \$142.3 million, an increase of nearly \$46 million over the FY 1991 appropriation. Our budget proposal continues to reflect Secretary Watkins' priority emphasis on environment, safety and health oversight. A summary table of our FY 1992 budget request is included at the end of this statement.

FY 1992 BUDGET HIGHLIGHTS

Special Projects (\$10.9 million): The Secretarial initiative of the Environment, Safety and Health Compliance Assessment ("Tiger Team") program continues. This program provides the Secretary with current assessments of the status of the DOE operating facilities compliance with applicable orders, statutes, and regulations pertaining to environment, safety and health (including OSHA) considerations. In FY 1992, Tiger Team assessments will be conducted at 18 DOE sites.

Environmental Audit (\$1.6 million): This program provides comprehensive, independent, Headquarters oversight of the Department's line management efforts to ensure compliance with all applicable environmental requirements and to reduce areas of existing environmental risk. In FY 1992 this program will conduct environmental audits at 18 DOE sites not subject to Tiger Team

assessments, and will conduct 12 independent oversight environmental audits of line management environmental programs.

Environmental Guidance (\$4.7 million): The goal of the Environmental Guidance program is to assure DOE-wide understanding of environmental laws and regulations applicable to DOE projects and operations, and, where appropriate, to establish DOE-wide environmental policy. During FY 1992, the Environmental Guidance program will continue to analyze and comment on emerging environmental regulations, develop guidance and provide environmental requirements training for use DOE-wide.

Environmental Compliance (\$5.0 million): This program establishes Departmental compliance policies and strategies for correcting DOE's environmental deficiencies and attaining compliance with applicable laws and regulations. This program ensures that DOE's environmental compliance policies and strategies are clearly defined and implemented consistently throughout the DOE complex. FY 1992 activities will include:

- Providing support for the development of technical/regulatory strategies for attaining compliance and implementing cleanups;
- Providing support for the participation in negotiations with regulators for compliance and cleanup agreements to correct

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environmental compliance, cleanup and waste management problems at DOE facilities; and

- Providing independent oversight and monitoring of compliance and cleanup agreements, Tiger Team action plans, and environmental audit action plans to ensure milestones and other commitments are met.

NEPA Oversight (\$7.0 million): The NEPA Oversight program provides independent internal oversight of DOE compliance with the National Environmental Policy Act (NEPA). It reviews and approves major NEPA-related documents and actions, issues NEPA-related policy guidance, provides NEPA-related technical assistance, and conducts NEPA compliance audits. In FY 1992 this program will complete an estimated 300 major document reviews (Environmental Assessments and Environmental Impact Statements), and approximately 300 significant NEPA-related review actions.

Quality and Safety (\$6.0 million): The mission of this program is to provide independent internal oversight of the DOE line programs for occupational safety, aviation, firearms, high explosive, pressure, industrial safety, facility safety, packaging and transportation safety, and quality assurance conducted by program offices, operations offices, power administrations, and operating contractors. FY 1992 program emphasis will be on providing oversight of DOE compliance with non-nuclear safety requirements

with emphasis on OSHA-type safety, and providing generic occupational safety training for DOE and contractor employees.

Safety Appraisals (\$15.0 million): This program provides independent oversight to assure that DOE's non-nuclear safety responsibilities are properly fulfilled. This oversight responsibility includes conducting independent appraisals, reviews, and technical evaluations of the operation and management of DOE's facilities. FY 1992 activities will include the conduct of 30 technical safety appraisals, including 18 in support of Tiger Teams, and the conduct of 40 functional appraisals in selected non-nuclear safety disciplines.

Safety Integration (\$3.7 million): The mission of this program is to develop and implement independent internal oversight programs that provide diagnostic assessments of DOE line management's safety and health program performance at nuclear and non-nuclear facilities. FY 1992 activities will include developing and disseminating safety and health information by using statistical and engineering analyses, determining generic safety and health lessons to be applied to DOE operations, and continuing the Environment, Safety and Health Site Resident Program which provides daily independent observations of field offices and operating contractors' activities.

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Health Physics and Industrial Hygiene (\$12.0 million): This program establishes policy, guidance, standards and procedures for the protection of workers and the public from operations involving radioactive and hazardous materials. FY 1992 activities will include:

- Establishing policy, guidance, standards and procedures for the protection of workers and the public from operations involving radioactive hazardous materials;
- Conducting a Health Physics and Industrial Hygiene enhanced oversight assessment program of the DOE line management programs and field offices;
- Continuing to provide technical support to field operations and contractors in instituting good health physics and industrial hygiene practices and procedures; and
- Providing educational opportunities for college graduates in the radiation protection/health physics and industrial hygiene disciplines in order to increase the pool of skilled specialists to meet future manpower needs in these critical areas.

Epidemiology and Health Surveillance (\$48.4 million): This program comprises all technical, research, policy, advisory and

-13-

support functions in the Department for activities related to health studies of human populations. This program was established as recommended by the Secretarial Panel for the Evaluation of Epidemiologic Research Activities (SPEERA). In addition to the above amount, \$13.3 million is being requested in the Defense Programs' and the Environmental Restoration and Waste Management's budgets for epidemiologic activities associated with the operation of defense facilities, as well as \$5.0 million for the Marshall Islands program. FY 1992 activities will include:

- Conducting epidemiologic research focusing on immediate concerns of workers and communities;
- Operating the Comprehensive Epidemiologic Data Resource (CEDR) with routine data dissemination and update; and
- Continuing dose reconstructions under the Department of Health and Human Services (DHHS).

Occupational Medicine (\$1.8 million): This office is responsible for carrying out a comprehensive occupational health program and providing critical, independent oversight of the occupational medicine programs of the Department's contractors. Policies and standards related to occupational medicine for the protection of workers and the public are developed for utilization at the Department's contractor facilities. In FY 1992, 45 occupational

medicine on-site appraisals will be conducted, and the Psychological Assessment Program and the Medical Evaluation for Human Reliability Program will continue.

Planning and Information Resources Management (\$4.1 million):

FY 1992 activities will include the continued operation and maintenance of the Safety Performance Management System (SPMS) and the Computer Assisted Tracking System (CATS). New analytical capabilities that include advanced environment, safety and health profiles to support performance assessments of DOE sites will be developed.

Program Direction (\$20.6 million): This account will provide funds for salary and benefit expenses for an increased staff of 265 full time equivalents (FTEs). Included are increases for travel, training, and administrative support expenses.

Capital Equipment (\$1.6 million): Capital equipment funds are requested to provide equipment for the DOE Laboratory Accreditation Program (DOELAP); for workplace safety equipment such as air quality instruments, radiation survey instruments, and noise level instruments; and equipment upgrades for the Safety Performance Management System and the Computer Assisted Tracking System.

-15-

Security Evaluations: Funds, totaling \$15.0 million, for this program are being requested in the Defense Programs' budget. This activity is the principal focal point in the Department for the independent oversight of the effectiveness of DOE safeguards and security policies and programs. A total of 8 comprehensive and 10 short, no-notice inspections will be conducted at key facilities in FY 1992.

Mr. Chairman and Members of the Subcommittee, that concludes my prepared remarks. I would be happy to answer any questions.

Mr. SCHEUER. Thank you very much, Dr. Ziemer.

We'll now hear from Dr. Clyde Frank. Dr. Clyde Frank currently serves as Associate Director of the Office of Technology Development in the Office of Environmental Restoration and Waste Management Program at DOE. As such, he is responsible for directing an integrated research and development program for technologies to remediate the existing waste sites, to minimize waste production, and to manage better waste as it is produced. Prior to his current assignment, Dr. Frank served on the staff of the Secretary of Energy where he developed a research and development for solving the Department's environmental problems.

Very good. I take it that your plan did solve all of the Department's environmental problems.

[Laughter.]

Mr. SCHEUER. Tell us about it.

STATEMENT OF DR. CLYDE FRANK, ASSOCIATE DIRECTOR, OFFICE OF TECHNOLOGY DEVELOPMENT, OFFICE OF ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT, DEPARTMENT OF ENERGY, WASHINGTON, D.C.

Dr. FRANK. Thank you, Mr. Chairman. I appreciate the opportunity to appear here today. I have submitted formal comments, and in addition to that a series of slides that hopefully will explain our program.

I think if one looks at the first slide after the cover of "The Technology Development, Fiscal Year 1991 and 1992 Programs", I believe that better defines—or fully defines—why we're in existence, our interaction with ES&H. We are in business to address environmental remediation and waste management issues that will reflect faster, better, cheaper, safer technologies and systems to relieve the Department of Energy in its present problem. At the bottom of that, I believe it also says, "while achieving and maintaining compliance".

These are environmental and occupational regulations, DOE compliance issues, et cetera.

The Office of Technology Development came into being when Mr. Duffy and the Secretary of Energy realized that the bill for environmental restoration was going to be very high and that it may be virtually impossible to address the issues within the 30-year goal. I was asked to come in to start—to create an R&D plan that would address these issues and we asked to stay on to attempt to implement what I wrote.

Over the years, it has been very difficult to inject new technologies in the remediation process. There are numerous reasons for this—some of them regulatory, some of them sociological, some are economic—but it becomes obvious that by looking at the number of "D9 Cats" that were sold 20 years ago and that are being sold today, we're essentially doing the same "hog and haul" technique that we were 20 years ago. Although that's good for the 55-gallon drum industry, it certainly is not good for the taxpayers of this country.

Essentially, what we attempted to pursue in the RDT&E plan was to develop a mechanism to deliver a system for remediation

which includes not only the remediation technology, but the characterization, performance assessment, remediation, and post closure technology to deliver to a specific site—tested at a specific site—that could be transferred to numerous other generic sites of the same quality—environmental quality and same or similar contaminant.

We believe that we can transfer 60 to 80 percent of the system to other sites successfully while maintaining the remediation technology.

By integrating the programmatic issues in environmental remediation and the technology development issues in which we define a very directed program that integrates the regulatory, economic, and technical issues within the development of the technology to integrate into the system, with all sectors in the third dimension—if you will—the integration of individuals and organizations, including regulatory, that will have impact on the success or failure of the remediation process.

The delivery of a system enables one to transition from the demonstration, testing, and evaluation process to the remediation process in a very rapid manner such that we define success in the Office of Technology Development as implementation only. It's not publishing papers. It's not writing reports. It is implementation of full scale systems for remediation of technology.

We've been in existence a little more than a year. We were formed right after Christmas—right after Thanksgiving of 1989. We've been in the process of protocol development in what we call a systems approach to the solution or problem. In other words, the first thing we need to do is understand what the problem is and then we need to understand what the root cause of that problem is.

It's what we call—and what Mr. Duffy calls the road map. It is systematically identified with three steps. The first step being assessment in which one assesses all information associated with that. The next step is analysis in which one analysis the information, identifies where the holes not only in technology are, but in compliance, occupational safety and health, and environmental safety and health. From there one goes to issues resolution, first within the Department of Energy, and then with all sectors. Then one develops a strategic plan for the accomplishment of a remediation issue. This is what we call the integrated demonstration.

We've been in protocol development of the road maps in which we now have four, one for the single shell tanks at Hanford that we are just completing, one for the buried waste program in Idaho, one for Rocky Flats, and one for Fernald as a facility.

We have completed the protocol development on an experimental basis for the integrated demonstration in which we addressed a major issue within the Department of Energy that is non-nuclear—it's known as VOCs, volatile organic compounds, particularly trichloroethylene in the soil and groundwater.

At Savannah River we were very successful in the initiation to tech transfer to—or initiation of tech transfer to NASA was a little less than 12 months. We've been able to decrease the cost of the remediation at Savannah River by at least 60 percent operating cost and have shown to have been able to drop the aquifer concentra-

tion of TCE in the groundwater to below clean water standards in less than 7 days.

We are operating equivalent to 11 pump and strip wells and we are now classified, I believe, by ourselves as a TCE production plant because we are now stripping from the soil and groundwater simultaneously 1,000 pounds of TCE a week at the Savannah River site. We believe that we are successful. Our success in this case, for the technologists, is when the State regulator, in this case, does not want the operation to shut down. We were redesigning the remediation system at Savannah River to using this new system that has been developed.

Thank you.

[The prepared statement of Dr. Frank follows:]

STATEMENT OF
DR. C. W. FRANK
ASSOCIATE DIRECTOR FOR TECHNOLOGY DEVELOPMENT
OFFICE OF ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT
U. S. DEPARTMENT OF ENERGY
BEFORE THE
COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY
SUBCOMMITTEE ON ENVIRONMENT
U.S. HOUSE OF REPRESENTATIVES

MARCH 7, 1991

Mr. Chairman, I appreciate the opportunity to appear today to discuss the Office of Environmental Restoration and Waste Management's fiscal year 1992 budget request for Office of Technology Development.

INTRODUCTION

The Department of Energy (DOE) is faced with the substantial task of cleaning up significant levels of radioactive and chemical pollutants introduced into the soil, surface water, and ground water at DOE and related sites as a result of over 40 years of defense production activities.

A little over 1 year ago, the DOE Office of Environmental Restoration and Waste Management (EM) was established to implement the Secretary's Environmental Restoration and Waste Management Five-Year Plan and to manage the cleanup program, as well as to provide centralized management and planning of projects identified in the Five-Year Plan. The magnitude of the environmental cleanup that is required, which appears to be the largest of any of the Federal agencies, is reflected in the substantial costs associated with this effort. The FY 1991 appropriation for EM activities was \$3.2 billion. The FY 1992 request is slightly over \$4.2 billion. EM's activities are

composed of three major areas: Waste Management, Environmental Restoration, and Technology Development. Today, I will discuss the Technology Development portion of the FY 1992 budget request.

The primary mission of the Technology Development program is to establish and maintain an aggressive national program for applied research, development, demonstration, testing, and evaluation (RDOT&E). The principal objective of the program is to resolve major technical issues and rapidly advance beyond current technologies for environmental restoration and waste management operations. The program is directed to support activities under the Office of Environmental Restoration and Waste Management. Numerous significant accomplishments have occurred in the past several years as a result of our efforts in applied research and educational development. These accomplishments, identified in Table 1 and appended to this statement, are an essential component of the overall environmental restoration and waste management program. Continued funding for these activities is essential if we are going to continue to develop the technologies and the skilled workforce necessary to deal with the complex environmental problems we face as we attempt to clean up our sites in the next 30 years.

As depicted in Table 1, the Office of Technology Development (OTD) supports the Department's 30-year cleanup goals by identifying or developing technologies which are safer, faster, less costly, and more effective. The OTD program is designed to establish the means to identify and prioritize needed technology development activities, aggressively use all internal and external resources to find solutions, and rapidly transfer those solutions to

DOE and other users. In addition, OTD is establishing and conducting programs to expand the national manpower pool available to address DOE environmental restoration and waste management problems. OTD also manages DOE's transportation activities, including the shipment of radioactive material and waste.

The FY 1992 budget request is being proposed under the Atomic Energy Defense Activities (AEDA) appropriation. The Department is also submitting a supplemental request in the Atomic Energy Defense Activities appropriation for FY 1991. The Technology Development portion of the supplemental request is \$30.0 million. The supplemental request in concert with the FY 1992 budget request of \$309.4 million will provide for a total program of \$339.4 million, all of which come under the AEDA appropriation. That is an increase over the FY 1991 appropriated level of \$133.4 million or 65 percent. The Transportation Management Division (TMD) budget for FY 1992 is \$18.9 million. Tables 2 and 3, appended also to this statement as Attachment 2, summarizes the President's FY 1992 budget request for Technology Development and Transportation Management activities.

A large part of the \$60.1 million increase over FY 1991 is associated with integrated RDDT&E demonstrations and programs. This provides for the continuation and expansion of five fully operational demonstrations; the buried waste program at the Idaho National Engineering Laboratory (INEL) in Idaho; underground storage tanks at the Hanford Site in Washington; cleanup of volatile organic components in saturated soils and groundwater at the Savannah River Site (SRS) in South Carolina; plutonium contaminated soils at the Nevada

Test Site (NTS); and cleanup of uranium contaminated soil at the Feed Materials Production Center (FMPC) in Ohio. Additional demonstrations being considered in FY 1992 include: cleanup of inorganic contaminants in soils and groundwater, in-situ vitrification, cleanup of non-volatile organic chemicals in unsaturated soils and groundwater at arid sites; waste treatment and waste destruction demonstrations; and decontamination and decommissioning (D&D) of concrete and metal structures. New integrated programs will be introduced to include characterization of wastes and sensor technology development. An increase of \$5.8 million is requested to expand innovative technology activities through solicitation of proposals from industry and the university community to address identified technology gaps. An additional \$14.1 million is requested for critical cross-cutting support activities including analytical laboratory management, robotics technology development, risk management, international program activities, prioritization of research techniques, and program management activities.

Environmental education development is requesting an increase of \$19.7 million to establish four additional academic partnerships (for a total of five) and to expand existing and new regional partnerships into a National Education Consortium. An additional \$11.1 million is requested for technology integration activities to initiate new activities that will infuse technologies from external sources and expedite diffusion of technologies to the private sector.

The Program Direction request, \$10.6 million, will provide for 111 technology development headquarters and field office staff. This funding was requested

in a separate headquarters Program Direction account in FY 1991. This funding is intended to develop new training initiatives, continue preparation of a Transportation Environmental Impact Statement, and increase Tribal and local government and public involvement.

Our request for Transportation Management for FY 1992 is \$18.9 million. Finally, an additional \$11.9 million over the FY 1991 appropriation is requested for the Environmental and Molecular Science Laboratory at the Hanford Site to provide for start of construction activities. The FY 1991 appropriation for EMSL was in Energy Supply Research and Development; for FY 1992, these funds are requested in Atomic Energy Defense Activities.

TECHNOLOGY DEVELOPMENT PROGRAM OVERVIEW

The Technology Development program addresses needs in five areas: (1) soil and groundwater cleanup; (2) waste retrieval and processing; (3) waste minimization and waste avoidance; (4) future personnel requirements; and (5) transportation. The Technology Development program is designed to respond to the users' needs. In this case, the users are the Waste Operations and Environmental Restoration organizations within EM and the DOE Offices of Nuclear Energy and Defense Programs.

INTEGRATED DEMONSTRATIONS

Some of the more significant RDDT&E component programs which will play a major role in EM activities in FY 1992 are discussed below. The RDDT&E program is organized around the Integrated Demonstration concept which focuses and directs research activities toward one objective: the implementation of fully workable, cost-effective solutions to DOE's serious environmental and waste management problems. Integrated Demonstrations and Integrated Programs are means by which the DOE will move technology products from universities, industry, government agencies, international agencies, and DOE laboratories into the hands of the user. An Integrated Demonstration is a cost-effective mechanism that assembles a group of related, synergistic technologies at one site to evaluate performance individually and as a complete system for a timely solution to environmental restoration and waste management problems.

The first Integrated Demonstration (ID) was developed at the Savannah River Site to remediate soils and groundwater contaminated with chlorinated solvents. After 60 days of operation, the Savannah River ID reduced groundwater contamination to Clean Water Act standards. The ID has removed over 15,000 pounds of volatile organic compounds (VOCs) from the sub-surface, equivalent to the capability of 11 conventional stripper wells. Data suggests that the system is effectively removing solvents from the subsurface, without causing the underground plume to spread. This is the first time horizontal drilling technology has been used for environmental restoration.

The ID approach is projected to be three times more cost effective than conventional pump and treat technology. The Savannah River ID could save DOE over \$70 million in technology demonstration, testing, and evaluation costs and over \$100 million in cleanup costs. Both the National Aeronautics and Space Administration (NASA) and the Environmental Protection Agency are interested in transferring this technology for use at NASA sites that are contaminated with volatile organics. We anticipate that the Integrated Demonstration technologies will be transferred to NASA within the next 2 months.

The ID concept will be applied to other environmental restoration issues within the DOE complex in FY 1993. Integrated Demonstrations will be developed to address: cleanup of volatile organic compounds in arid soils and groundwater, cleanup of plutonium-contaminated soils, cleanup of uranium in contaminated soils, remediation and treatment of retrieved waste, and the buried waste program at Idaho (the current program is transitioning to an ID). Integrated Demonstrations can be categorized in three general areas: (1) groundwater remediation and soils cleanup; (2) waste retrieval and waste processing; and (3) waste minimization. We hope to initiate Integrated Demonstrations to implement solutions to major problems at other DOE sites.

WASTE RETRIEVAL AND PROCESSING TECHNOLOGIES

In FY 1991, technologies will be developed and demonstrated to remotely excavate material from the subsurface. An integrated demonstration was initiated in FY 1991 to address characterization, removal, and processing of

wastes in the Hanford underground storage tanks. OTD is also continuing to support the Idaho Buried Waste Program and will attempt to focus a variety of research and development activities into a single integrated demonstration program in FY 1991.

Two engineering scale, in-situ vitrification demonstrations were completed at the INEL in FY 1990 on mock-up waste pits, one with stacked drums and high metal content waste and one with randomly deposited waste. The demonstrations showed the potential to cleanup a site without exhuming buried waste. DOE also demonstrated the vacuum vapor extraction of carbon tetrachloride from beneath the INEL Radioactive Waste Management Complex. Implementation of this technology can control the spread of contamination and aid the cleanup of presently contaminated areas.

WASTE MINIMIZATION AND AVOIDANCE

This priority effort for the substitution of materials and the development of new processes to reduce or eliminate the use of hazardous materials in weapons production. This includes: development of alternative metal-forming processes that consume less stock and yield less waste, recycling of scrap, and substitution of non-chlorinated solvents. Aggressive waste minimization is the best way to reduce the future cost of defense waste management and conserve limited defense funding for use in weapons design, materials production, and environmental restoration.

Several advances have been made in waste minimization. In February 1990, DOE signed a Memorandum of Agreement with the U.S. Air Force and Boeing to leverage \$2 million in Federal funds into \$12 million to address joint solvent substitution goals. At the Department's Y-12 Plant, located in Oak Ridge, Tennessee, the use of all chlorinated hydrocarbons in the or alloy process has been eliminated. Also, the spray forming of surface coatings with chromium has been demonstrated without the generation of highly acidic heavy-metal wastes that are produced by electroplating. Finally, DOE implemented an environmentally-conscious manufacturing program at Sandia National Laboratory.

In FY 1991, the DOE Offices of Environmental Restoration and Waste Management and Defense Programs jointly funded a call for proposals for the minimization of waste generated at the Government-owned production facilities that comprise the Nuclear Weapons Complex.

TECHNOLOGY INTEGRATION

This program ensures the rapid, implementation of efficient technology for environmental restoration and waste management initiatives by encouraging transfer of technology among Federal agencies, industry, universities, national laboratories, and appropriate international partners.

EDUCATION DEVELOPMENT

This program identifies DOE's human resource needs for environmental restoration and waste management and develops innovative national programs to

ensure that these needs are met. The program establishes partnerships with the academic community to promote environmental sciences curricula and encourage students to pursue environmental management careers. The program also aims to involve minorities, women, Native Americans, and disadvantaged students in environmental programs. To pursue these goals, pilot DOE/university partnerships, scholarship and fellowship programs, and an outreach program for grades K-through-12 have been established.

To date, EM education activities have reached over 100,000 students; awarded 15 scholarships and fellowships at minority institutions; and awarded 25 scholarships, 20 fellowships, and 6 young faculty grants which were nationally competed. As an example of program activities, at the Idaho site the Science Education Outreach Program has implemented activities that will increase the exposure of rural students and their teachers to the world of science and math.

ENVIRONMENTAL AND MOLECULAR SCIENCES LABORATORY

Construction of the EMSL at the Hanford Site will provide a research facility that will allow DOE to study fundamental molecular processes in the environment and develop permanent solutions to the Nation's energy, environmental, and waste recovery problems.

TRANSPORTATION MANAGEMENT DIVISION

This division develops policies and management procedures to facilitate DOE transportation activities, including the shipment of radioactive material and waste. In addition to developing safe guidelines for DOE's packaging, including packaging maintenance and use, DOE conducts other operational activities, such as: (1) negotiating rates and services, (2) developing DOE specific standards, over and above regulatory requirements, (3) training DOE and contractor personnel and others on regulations and procedures governing radioactive and other hazardous material shipments, and (4) maintaining data systems to enable DOE and other interested parties to retrieve and analyze information on DOE shipments.

The DOE also appraises field operations to assure that they are in compliance with regulations and procedures, conducts research and development, manages the EM emergency preparedness program, and facilitates interactions between DOE and outside parties interested in DOE's transportation activities. During the past year, DOE completed all Three Mile Island waste shipments without incident. In addition, DOE trained several thousand personnel in packaging, shipping, and emergency response.

CONCLUSION

The Department's environmental restoration and waste management Technology Development program appears to be headed down the right path, but it is clearly recognized that there is a long way to go. We must continue to direct

our efforts at putting in place an effective long range program. We need to continue to actively pursue research and development that will deliver technologies that will help us to do our job safer, faster, better and cheaper.

- DOE -

Table 1. DOE Office of Environmental Restoration and Waste Management Accomplishments--Technology Development

FY 1990:

- Eliminated use of chlorinated hydrocarbons (CFCs) at Y-12 Plant
- Implemented leveraged agreements with the Air Force and Boeing to demonstrate solvent substitution and develop waste minimization technologies
- Implemented environmentally conscious manufacturing program
- Completed Three Mile Island radioactive waste shipments without incident
- Trained thousands of persons in radioactive shipping/emergency response (ongoing)
- Established K-through-12 outreach programs at each DOE site, reaching over 137,000 citizens, 122,000 students, and 2,400 educators (ongoing)
- Awarded minority university partnership to enhance curriculum and conduct collaborative research
- Initiated community college partnerships to develop 2-year technician degree programs
- Awarded 15 minority scholarships and fellowships and over 50 national fellowships and faculty awards (ongoing)

FY 1991:

- Achieve full operational status of the Savannah River Integrated Demonstration:
 - Clean Water Act standards achieved in 60 days
 - Capacity equivalent to 11 conventional stripper wells
 - First use of horizontal drilling for remediation
 - DOE pursuing world-wide patent for concept
- Complete planning of 8 additional integrated demonstrations:
 - Plutonium-contaminated Soils
 - Uranium-contaminated Soils
 - Unsaturated Soil Cleanup (arid sites)
 - Newly generated Mixed Waste
 - RCRA Wastes
 - Combustible Waste
 - In-situ Vitrification
 - Advanced Processing
- Startup of Plutonium-Contaminated Soil Integrated Demonstration
- Demonstrate spray form casting without generation of acidic heavy-metal wastes
- Demonstrate extraction of contaminants from beneath buildings
- Demonstrate remediation without exhuming buried waste
- Reusable HEPA filters available for use at DOE sites
- Complete integrated robotics planning

Planned FY 1992 Accomplishments:

- Full operational status of Plutonium-contaminated Soils Integrated Demonstration
- Full operational status of the Depleted Uranium Waste Minimization Integrated Demonstration at Y-12 Plant
- Full operational status of the Environmentally-Conscious Electronics Manufacturing Integrated Demonstration
- Startup of 4 integrated demonstrations:
 - Uranium-contaminated Soils
 - Unsaturated Soil Cleanup (arid sites)
 - Non-plutonium/uranium metals in Soils
 - Toxic Chemicals
 - Plutonium Waste Minimization Integrated Demonstration at Rocky Flats Plant
- Initiate planning of 2 integrated demonstrations:
 - Non-Radioactive Components Manufacturing
 - General Waste Minimization
- Demonstrate destruction of RCRA components of mixed waste
- Create 5 additional academic partnerships

Table 2. FY 1992 Budget Request--Technology Development

	(\$ in Thousands)	
<u>Subactivity</u>	<u>FY 1991</u>	<u>FY 1992</u>
Applied Research and Development	\$ 53,431	\$ 52,221
Demonstration, Testing and Evaluation	96,086	157,428
Innovative Technology	4,985	10,800
Program Support	19,295	33,429
ER/MM Technology Integration and		
Environmental Education Development	27,000	57,800
Program Direction	0 a/	10,600
Construction:		
Environmental and Molecular Science		
Laboratory	<u>5,170</u>	<u>17,100</u>
Total	\$205,967	\$339,378
Less Adjustment for FY 1991 Supplemental Request		<u>-30,000</u>
GRAND TOTAL		<u>\$309,378</u>

Table 3. FY 1992 Budget Request--Transportation Management

Transportation Management	0 b/	<u>18,870</u>
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a/ Funding in FY 1991 was appropriated in a central EM program direction line.

b/ This activity was appropriated in the Waste Transportation and Site Management program in FY 1991.

PRIORITIZATION

Scheuer Subcommittee Hearing
March 7, 1991

ISSUES/FACTS

Achievement of EM's goals within available funds requires prioritization of environmental restoration projects and waste management improvements.

BACKGROUND/DISCUSSION

- o The initial site survey by EH resulted in a risk-based ranking of DOE problems. The methodology did not use the same principals as EPA's Superfund ranking method. National Academy of Sciences (NAS) was asked to review the ranking methodology and the results.
- o EM-40 has developed a multi-variate analysis system for risk based ranking of environmental restoration projects. The principals used in developing the methodology are those supported by the NAS for use by the Office of Civilian Radioactive Waste. The system was developed in cooperation with Indian Tribes, local and state agencies, other Federal agencies, and national interest groups. The system will be applied to support FY 1993 budget decisions.
- o EM-30 has developed a separate prioritization system to prioritize ongoing activities and reflect regulatory compliance in the broadest sense. The system is based on direct health, safety, environmental, and regulatory risk. It will also be applied to support FY 1993 budget decisions.
- o EM-50 will prioritize the technology development to meet the needs identified in the higher ranked waste management and environmental restoration projects. The correlation between higher priority technology development projects and higher ranked problems is not always one to one. EM-50 must consider the probability of successful development, the requirement to implement an entire system to solve a problem, and the status of the technology under development.

CONCERNS/SENSITIVITIES

- o The public may find it difficult to understand why several systems are necessary to prioritize EM projects. They may believe prioritization is a single problem rather than several.
- o If the same environmental problem is ranked differently by regulators, national interest groups and DOE, the public will be confused.

**PRIORITY SYSTEM FOR ENVIRONMENTAL
RESTORATION**

**•RISK-BASED SYSTEM FOR FORMULATING AND
ALLOCATING BUDGET**

**•SYSTEM COMBINES AN INITIAL SCREENING PROCESS
BASED ON URGENCY OF PROPOSED CLEANUP ACTIVITIES
(SEE FLOW DIAGRAM) WITH A QUANTITATIVE ANALYSIS
(USING A MULTICRITERIA OPTIMIZATION TECHNIQUE, SEE
CRITERIA HIERARCHY) TO DETERMINE --**

- VALUE OF ALTERNATIVE TOTAL ER FUNDING LEVELS

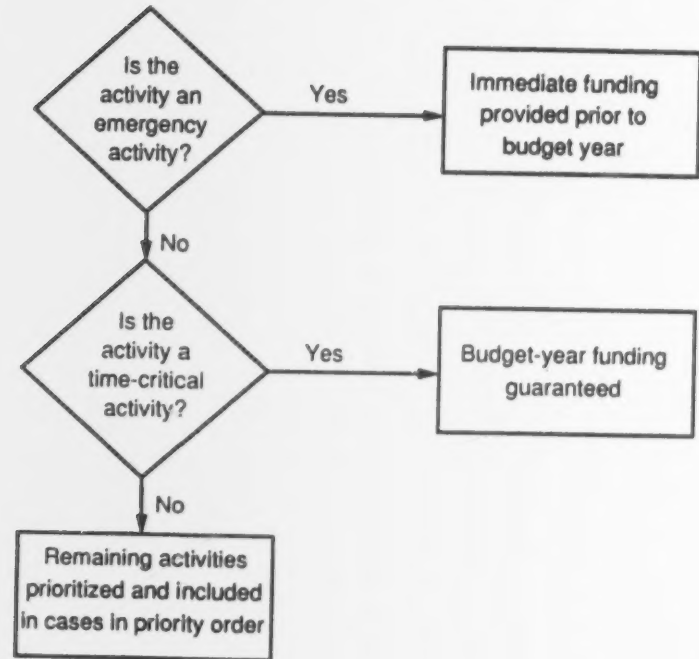
**- OPTIMAL ALLOCATION OF ER FUNDS AMONG MORE
THAN 80 INSTALLATIONS LOCATED IN SOME 20 STATES**

**•QUANTITATIVE ANALYSIS FOCUSES ON EFFECTIVENESS OF
PROPOSED SOLUTIONS TO ENVIRONMENTAL PROBLEMS,
RATHER THAN SOLELY ON SEVERITY OF PROBLEMS, TO
HELP ENSURE FUNDS WILL HAVE GREATEST BENEFICIAL
IMPACT**

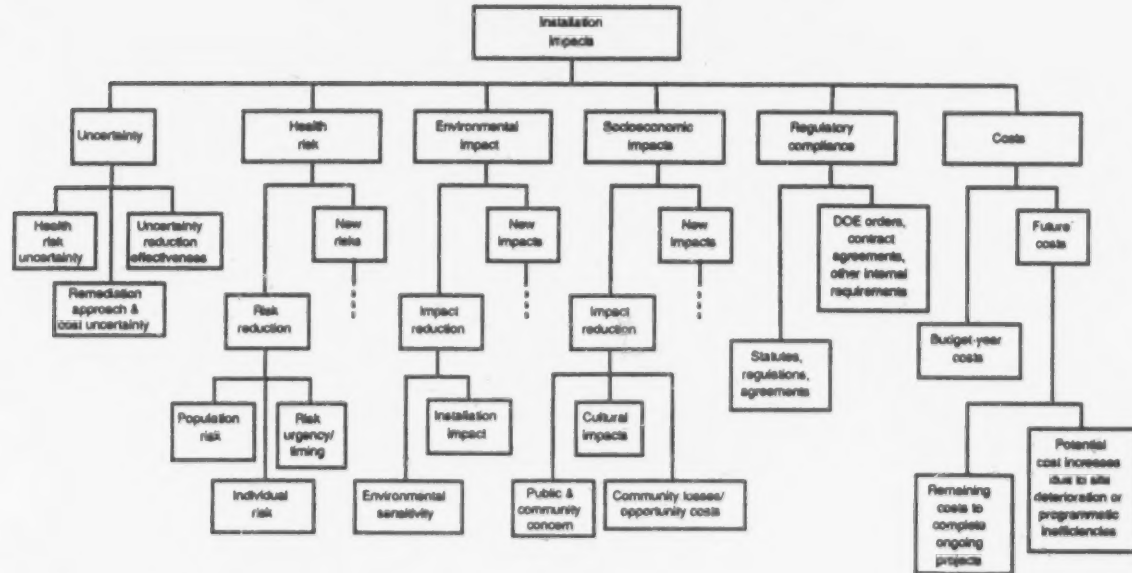
**•SYSTEM DEVELOPED IN CONSULTATION WITH A WIDE
RANGE OF OUTSIDE PARTIES AND DOE PLANS TO INVOLVE
OUTSIDE PARTIES DURING IMPLEMENTATION OF SYSTEM**

**•FORMAL PEER REVIEW AND PUBLIC REVIEW VIA FEDERAL
REGISTER NOTICE PLANNED FOR THIS SPRING**

SCREENING ENSURES TIMELY FUNDING FOR ESSENTIAL ACTIVITIES



CRITERIA FOR EVALUATING FUNDING OPTIONS ORGANIZED IN A HIERARCHY



NOTE:

Dashed lines below "New risks" and "New Impacts" indicate subjective structures similar to those shown under "Risk reduction" or "Impact reduction", respectively.

WASTE MANAGEMENT PRIORITIZATION SYSTEM

CATEGORY 1:

**PREVENTS NEAR-TERM ADVERSE IMPACTS TO WORKERS,
PUBLIC, ENVIRONMENT, OR PROGRAM RESOURCES**

CATEGORY 2:

MEETS TERMS OF FORMAL, LEGAL AGREEMENTS

• SUBCATEGORY 2A

- COMPLIES WITH AGREEMENT PROVISIONS THAT HAVE
CRIMINAL OR CIVIL LIABILITY PENALTIES**

CATEGORY 3:

**PROVIDES FOR REGULATORY COMPLIANCE NOT CAPTURED IN
1 OR 2 AND PREVENTS DOE MISSION DISRUPTIONS**

CATEGORY 4:

**PROVIDES ACTIVITIES ABOVE AND BEYOND REGULATORY
REQUIREMENTS.**

NEXT STEPS

- EVALUATE INTERIM SYSTEM AND CONDUCT NEEDS
ASSESSMENT**
- DEVELOP MODEL**
- CONDUCT PILOT TESTING**
- IMPLEMENT SYSTEM**



The Technology Development FY 1991 and 1992 Programs

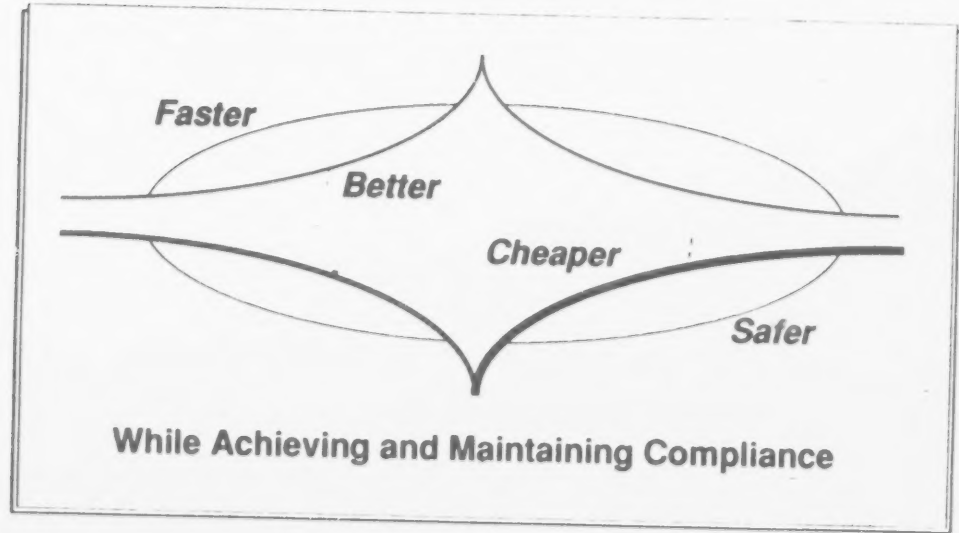
**Presentation for House Space, Science and
Technology Committee
Subcommittee on Environment**

March 7, 1991

**DR. CLYDE FRANK
Office of Technology Development**

**ENVIRONMENTAL RESTORATION
AND WASTE MANAGEMENT**

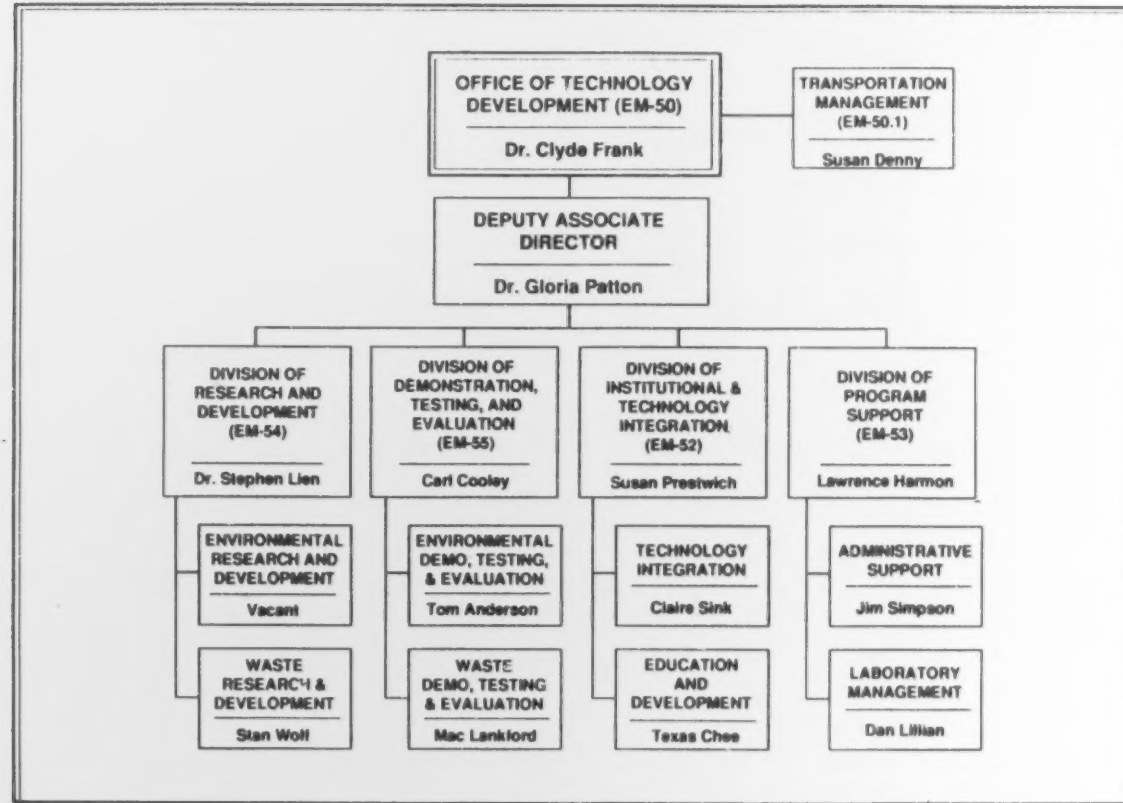
Office of Technology Development Organization and Objectives



Mission and Organization
Budget Summary

OTD Mission

- Rapidly develop, demonstrate, and transfer needed technology to Environmental Restoration, Waste Operations, and Defense Programs
- Minimize waste generation (toxicity or volume)
- Obtain faster, better, cheaper, safer, cleanup, management, and permanent disposal of waste
- Achieve compliance on schedule
- Assure safe transport of hazardous and radioactive materials
- Attract and train the next generation of personnel for ER/WO solutions



Division Functions

- | | |
|--|---|
| Research & Development | - Is responsible for the formulation and management of projects to develop technology products based on ER and WO needs for subsequent DT&E and full user implementation |
| Demonstration, Testing And Evaluation | - Is responsible for the formulation and management of projects to validate technologies for user acceptance and implementation by demonstrating effectiveness, cost savings, risk-reduction potential, site applicability, and regulatory and public acceptance |
| Education | - Is responsible for identifying DOE's human resource needs for Waste Management and Environmental Restoration and developing innovative programs to ensure the required human resources are available to meet the 30-year cleanup goals. This division is also responsible for technology integration including technology transfer into and out of the OTD program |
| Program Support | - Is responsible for activities supporting the creation, management, and interactions of the Office of Technology Development (TD), as well as coordination of certain EM-wide initiatives. In addition to management and administrative activities this division has responsibilities for regulatory analyses of various types, information management systems, program quality assurance, and coordination of the department analytical laboratory system |
| Transportation | - Is responsible for managing and coordinating policies and procedures for all of DOE's unclassified shipping activities, developing technology to support safe and efficient operation of the transportation system, and conducting faster resolution of transportation issues |

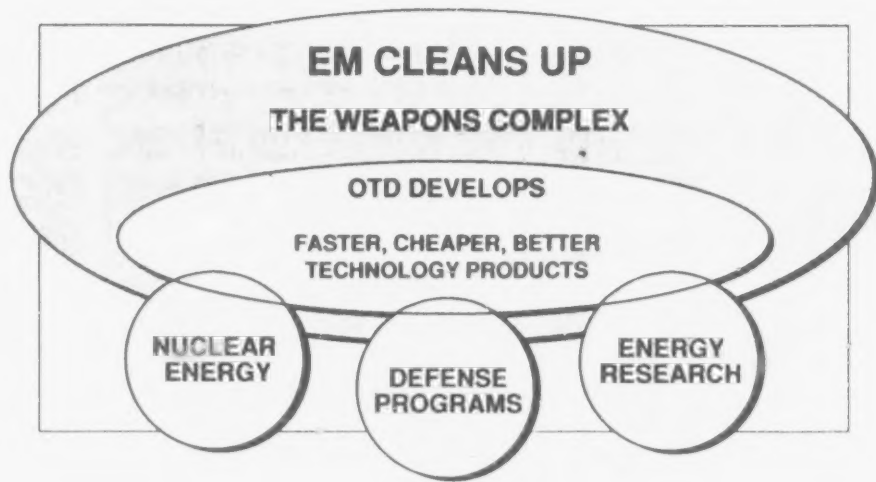
Office of Technology Development

	PROGRAM ELEMENTS (\$ IN MILLIONS)	
	FY 1991	FY 1992
Technology Development		
Applied R&D	53.4	52.2
Demo, Testing and Evaluation	96.1	157.5
Innovative Technology	5.0	10.8
Education and Technology Integration	27.0	57.8
Program Support	19.3	33.4
Program Direction	0.0	10.6
EMSL Construction Project	5.2	17.1
Subtotal, Technology Development	206.0	339.4
Transportation Management	15.2	18.9
Total FY 1991	221.2	358.3

Office of Technology Development FY 1991 and FY 1992 Program Budget Summary

	(\$ IN MILLIONS)	
	<u>FY 1991</u>	<u>FY 1992</u>
Integrated Demonstrations Under:		
Soil and Groundwater Cleanup	30.3	61.3
Waste Retrieval and Processing	77.0	124.3
Waste Minimization and Waste Reduction	37.0	14.1
Supporting Technologies (Robotics, Risk Mgmt)	10.2	20.8
Education Development	23.0	42.8
Technology Integration	4.0	15.0
Program Support	19.3	33.4
Program Direction	0.0	10.6
Environmental & Molecular Science Lab (EMSL)	<u>5.2</u>	<u>17.1</u>
Subtotal, Technology Development	206.0	339.4
Transportation Management	<u>15.3</u>	<u>18.9</u>
	221.3	358.3

The Office of Technology Development (OTD) provides needs-based, innovative, better, safer and proven technology products for the user...



Why We Are In Business

Why We Are In Business

OTD Program Products will:

- **Decrease cost**
- **Decrease risk to workers and the public**
- **Decrease waste toxicity and volume**
- **Increase ability to achieve 30 year goal**

**FASTER, BETTER, CHEAPER, SAFER
WHILE ACHIEVING AND MAINTAINING COMPLIANCE**

Soil and Groundwater Cleanup Needs

- **Source** – **Regulatory site closures**
- **Scope** – **3,700 hazardous, radioactive, mixed waste
release sites**
5,200 mill tailing sites

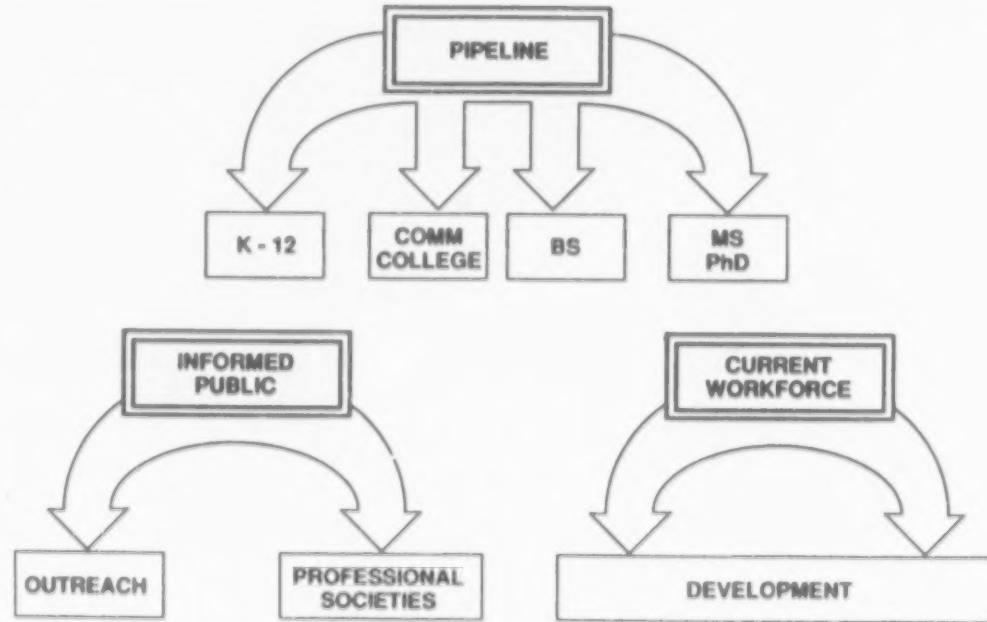
Waste Retrieval and Processing Needs

- **Source** – DOE inventory of wastes from historical accumulation of 45 years and recent regulatory compliance requirements
- **Scope** – 385,000 M³ high level waste
600,000 M³ transuranic waste
2,473,000 M³ low level waste
 - RCRA hazardous waste
 - Reduction of cost and risk for retrieving buried waste
 - Reduction of cost and risk for waste processing

Waste Minimization and Waste Reduction Needs

- **Source** – Newly generated waste streams from DOE operations
 - Greater than 80% from nuclear weapons programs
- **Scope** – 250 M³ /yr high level waste
2,500 M³ /yr transuranic waste
150,000 M³ /yr low level waste
 - Hazardous waste (i.e., chlorinated hydrocarbon solvents)
 - Mixed waste

Present and Future Personnel Needs



Transportation Needs

- **Emergency Preparedness**
- **Public Awareness**
- **Automated Transportation Management Systems**
- **Regulatory Compliance**

The Integrated Demonstration Strategy

"Success Is Implementation"

Roadmaps Identify EM Root Cause Issues, Aid Strategic Planning, and Validate User Needs

The 1993 Five-Year Plan

Single Shell Tanks at Hanford

Buried Waste Program at Idaho

Rocky Flats Plant

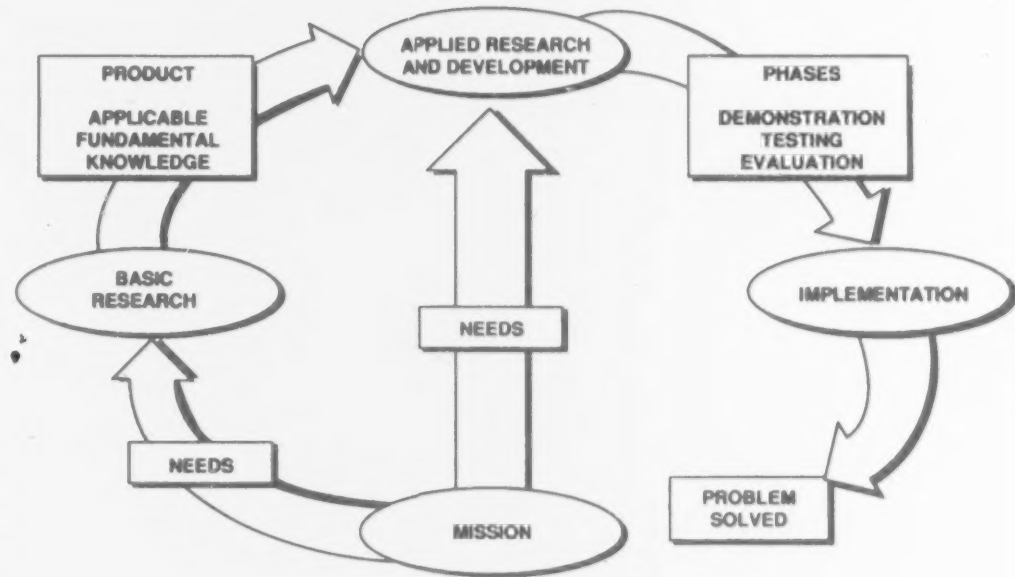
Waste Isolation Pilot Plant

Fernald Environmental Restoration

The 1994 Five-Year Plan

The Entire Complex

The RDDT&E Process Accelerates New Technologies Through Phases Of Research, Development, Demontsraton, Testing and Evaluation



Technology Development Components

INNOVATIVE TECHNOLOGY ASSESSMENT

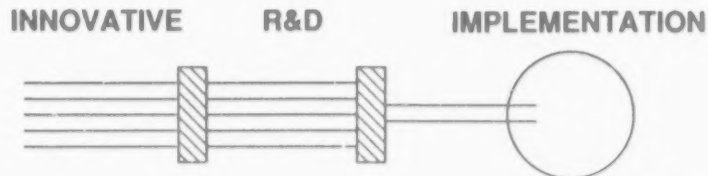
- Activities to collect experimental data to address two questions
 - Is it applicable to DOE problems?
 - Is it technically/regulatorily feasible?

APPLIED R&D

- Activities to generate data in support of engineering specifications for full scale implementation

DT&E

- Activities associated with transition to full scale implementation



Nationally, It Has Been Difficult To Inject New Technology
Into The Programmatic Process On Schedule . . .

***THERE IS A
NEW
DIRECTION***

The Integrated Demonstration Solves The Problem Of Delivering Usable Technology On A Tight Schedule



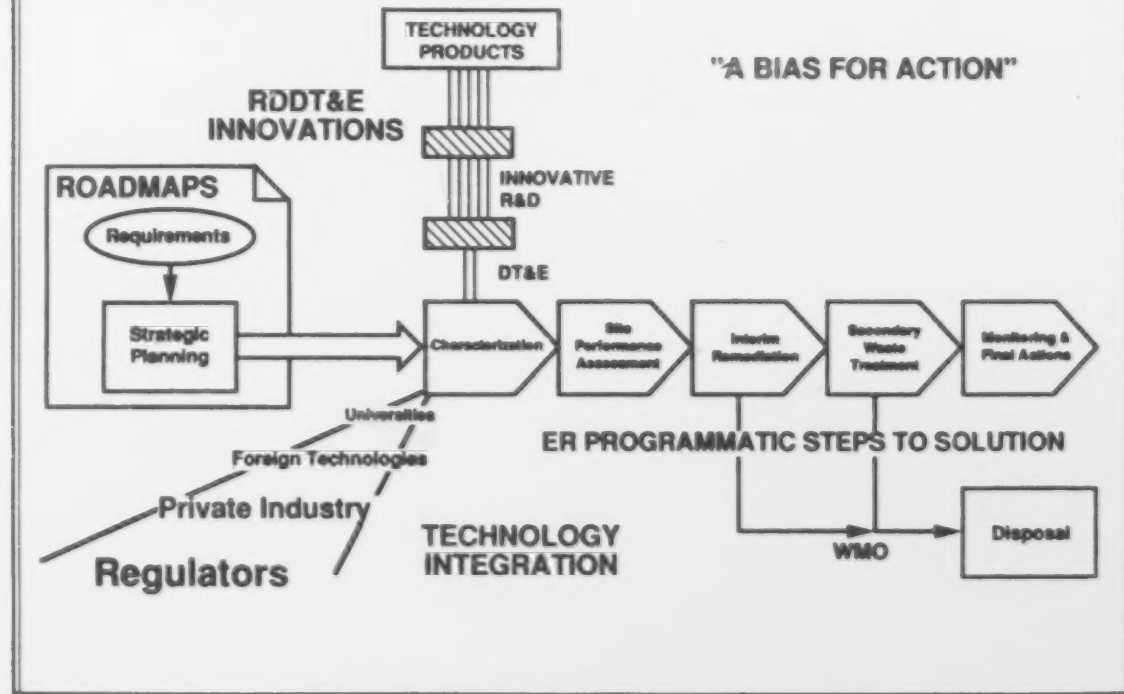
An Integrated Demonstration is the Office of Technology Development's time and cost-effective management concept that uses discriminating, end-to-end, and externally interactive approach to assemble and evaluate related and synergistic technologies with respect to their performance, desirability, and acceptability for correcting Waste Management and Environmental Restoration problems.

Criteria for Success of an Integrated Demonstration Project

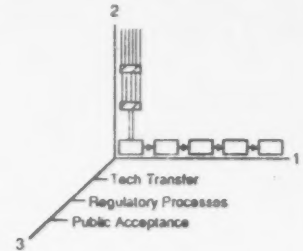
- **Responsive to ER&WO near term needs**
- **Accomplishes transfer of technology to ER&WO and others**
- **Shows acceptable and expedient regulatory process for future use**
- **Achieves regulatory compliance**
- **Shows permanency**
- **Saves money through scale & efficiency**
- **Reduces risk**
- **Minimizes generation of more waste**
- **Facilitates social acceptance**

SUCCESS = IMPLEMENTATION

The Three Dimensions of an Integrated Demonstration



Integrated Demonstrations are Three Dimensional



Dimension 1 - The Operational Dimension

Addresses all of the "Cradle -to-Grave" steps necessary to solve an environmental problem

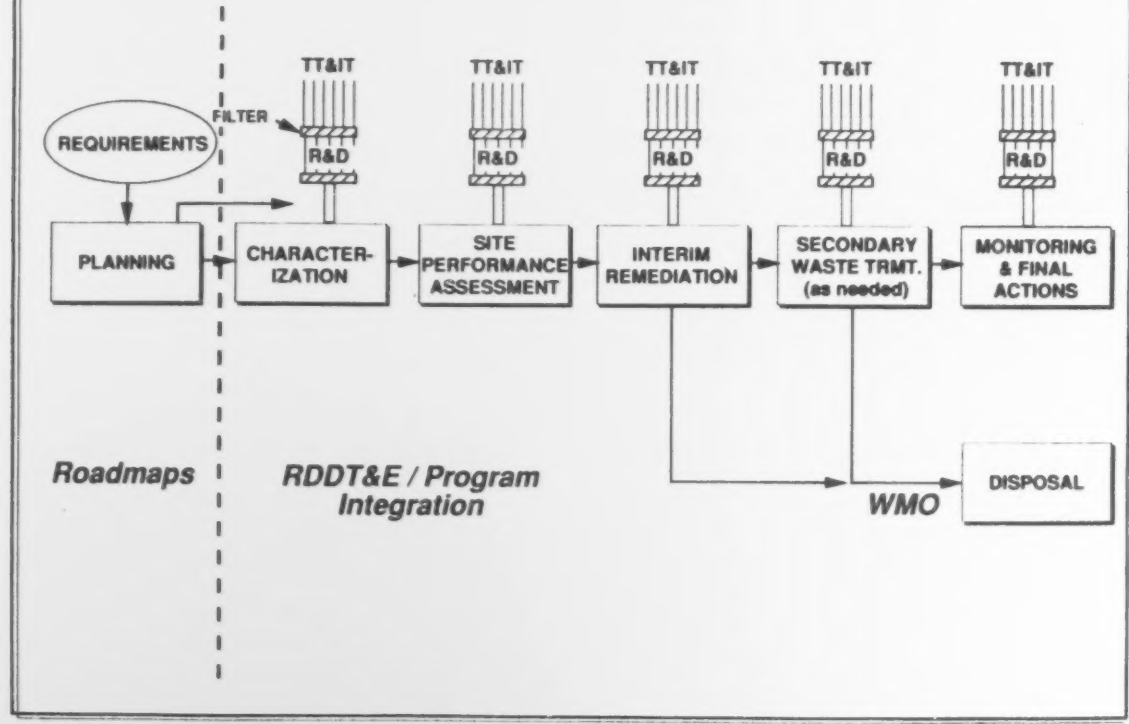
Dimension 2 - The Technology Filtering Dimension

Inserts innovative technologies through R&D and DT&E progressive filtering process

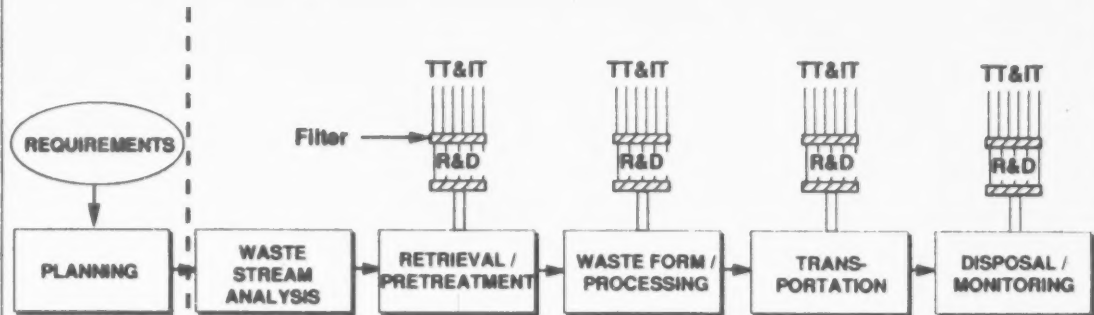
Dimension 3- The Technology Integration Dimension

Expedites regulatory and public acceptance processes through early and continuous involvement of affected stakeholders, and transfers of cleanup technology into and out of DOE.

Functional Requirements Of Environmental Restoration Integrated Demonstrations



Functional Requirements Of Waste Operations Integrated Demonstrations *



Roadmaps

- ★ Like ER, WO integrated demonstrations will have inputs on requirements, include assessment of multiple options, and make recommendations

The Advantages of Integrated Demonstrations

- **Cost savings in permits/NEPA processes**
- **Enhanced collaboration among all sectors**
- **Savings in technology development cost**
- **Assures rapid progression from RDDT&E to implementation**
- **Focused effort**
- **Assures implementation of entire systems, cradle to grave**
- **Assures compatibility of technologies**
- **Success oriented, "bias for action" scenario**

**EARLY IMPLEMENTATION OF
END-TO-END SOLUTIONS**

**THE SAVANNAH RIVER INTEGRATED
DEMONSTRATION**

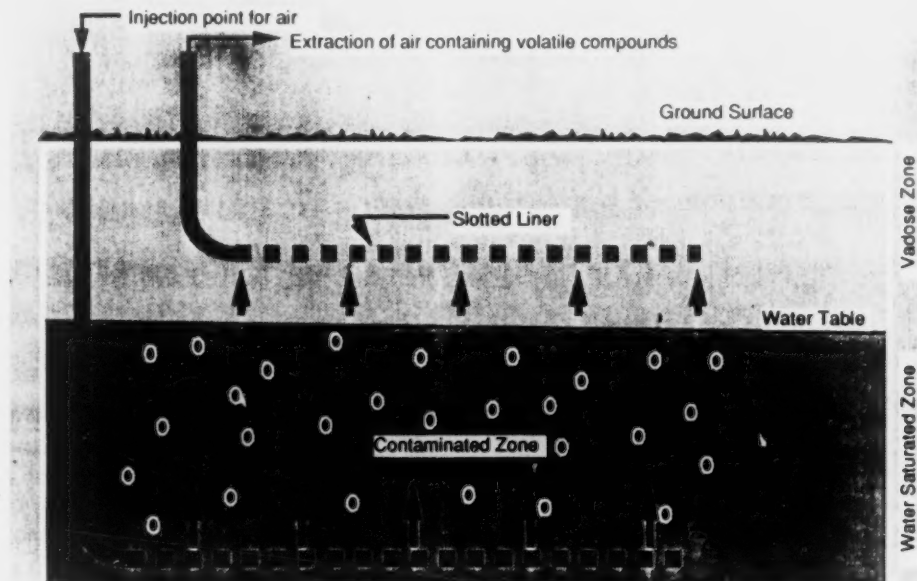
FY 1990

**IN SITU REMOVAL OF VOLATILE
ORGANIC COMPOUNDS FROM
SATURATED CLAY MEDIA**

**The Objectives of the Integrated
Demonstration at the Savannah River Site are:**

- **Development of protocol for future integrated demonstrations**
- **Demonstration of new technologies to remediate groundwater and soils in situ**
- **Demonstration of new technologies for characterization, monitoring and modeling for Environmental Restoration activities**

Our First Integrated Demonstration is Underway at Savannah River



The Savannah River Integrated Demonstration Return on Investment

DEMONSTRATION SAVINGS

\$ 72M

**Demonstrate 20 technologies under one set of
Regulatory Permits, single test bed characterization and
environmental model, lower operating costs, and one post-
closure monitoring network**

REMEDATION SAVINGS

\$ 125M

**Horizontal well in situ technology 3 times more effective than
conventional pump and treat: No water disposal costs and R&D
ROI 25 - 60:1**

FY 90 Accomplishments

Soils and Groundwater Cleanup - FY '90 Accomplishments

- **Began demonstration of 12 in situ characterization, remediation and supporting technologies as part of the Cleanup of Volatile Organics in Non-Arid Soils and Groundwater Integrated Demonstration**
- **Developed portable ion-trap mass spectrometer with detection limits below standards with less than half sample processing time**
- **In situ vitrification tested on buried objects and cribs**
- **Bench scale testing of supported liquid membranes.**
- **Pilot scale testing of nitrate/carbon tetrachloride bioreactor**
- **Vapor vacuum extraction (VVE) technology initiated**
- **Demonstrated In Situ Fiber Optic DUVAS Monitor for Organics**
- **Planned two integrated R&D programs (in situ remediation, characterization)**

Waste Retrieval and Waste Processing - FY '90 Accomplishments

- Completed shakedown tests for the pilot demo of plasma arc processing of waste at Butte
- Integrated alternative organic destruction technologies into single program
- Completed pilot ISV cold test for buried waste
- Demonstrated reactive metals disposal
- Demonstrated continuous VOC monitoring in the ppb range
- Evaluated polyethylene encapsulation matrix to facilitate transport of low-level waste
- Integrated cooperation on robotics
- Conducted supercritical water oxidation treatment testing
- Initiated development of decontamination methods for scrap metals and concrete
- Completed demonstration for removal of hexone from tanks
- Developed molten salt destruction technology
- Planned integrated R&D program to develop new innovative waste treatment technologies

Waste Minimization and Waste Avoidance - FY '90 Accomplishments

- **Initiated waste stream characterization**
- **Implemented environmentally conscious manufacturing program with Sandia, Mound, Pinellas and Kansas City**
- **Completed elimination of chlorinated hydrocarbons (or alloy process - Y-12)**
- **Successfully demonstrated bagless posting to eliminate plastics from TRU waste drums**
- **Set aggressive waste minimization goals across complex (50-80% decrease by 2000)**
- **Waste acid decontamination/recovery technology available to private sector**

Other ID Related FY '90 Accomplishments

• ROBOTICS

- Initiated robotics integrated planning activity**
- Initiated automated lab consortium with the National Institute of Standards Technology (NIST)**
- Conducted initial automated laboratory research and development**
- Initiated design for Pu/U machine demonstration**
- Evaluated automation of glove box operations**

• DP/EM MOU

- Signed EM/DP Memorandum of Understanding to jointly develop an aggressive waste minimization program with lab/production facilities**
- Initiated modeling of a process line**

• DOE/AIR FORCE MOA

- Signed Memoranda of Understanding with the U.S. Air Force and Boeing (leveraged \$2M DOE funds to \$12M)**
- Initiated planning of cooperative activities with the Air Force**
- Initiated solvent substitution and metal manufacturing development activities**

Education - FY '90 Accomplishments

- **Established partnerships with New Mexico and South Carolina (8,600 students and 80+ faculty)**
 - **27 collaborative research tasks**
 - **Accreditation of curriculum under way**
 - **Distinguished Scientist Program**
- **Awarded new partnership to HBCU/MI (4,300 students and 40+ faculty)**
- **Major minority focused fellowships and scholarships (30 fellows/scholars)**
 - **Secretary of Energy's Minority Fellowship/Scholarship Program**
- **Awarded through national competition - 25 scholars, 20 fellows & 6 young faculty**
- **Community college initiatives for technicians (700 students and 27 faculty)**
- **Pre-college and public outreach programs related to ER&WM needs established at each Operations Office (137,000 citizens, 122,000 students, and 2,400 teachers)**

Transportation - FY '90 Accomplishments

- **Completed TMI shipments**
- **Continued operation of transcom**
- **Established formalized Transportation Emergency Management Program (includes training)**
- **Expanded training program - driver training, load securement, waste transport**
- **Enhanced interactions with local officials nationwide; introduced formal interactions with State tribal governments**
- **Focused written and video materials on student education and emergency response**
- **Completed full-scale Type B cask model**
- **Initiated hazardous and mixed waste packaging needs assessment**
- **Began planning for a Transportation Environmental Impact Statement**

We Paid for Ourselves in FY 1990

FY 1990 Budget

\$195.6M

Projected Cost Savings Through Technology Development

	<u>Projected Savings (1 Year)</u>	<u>10 Year Savings</u>
• Reduction of low level waste volume at Y-12	\$ 57M	\$.57B
• Supercritical water oxidation: destroys RCRA components in mixed waste	33M	.33B
• Stainless steel HEPA filters: cleanable, reusable filters	98M	.98B
• Innovative instrumentation: real time, in situ monitoring and analysis	200M	2.0B
• Automated analytical laboratories: 300,000 environmental samples per year	350M	3.5B

The Technology Development Program by Program Element

(\$ Millions)

<u>Program Element</u>	<u>FY 1991 Appropriation</u>	<u>FY 1992 Request</u>
Technology development	\$ 206.0	\$ 339.4
Transportation management	15.2	18.9
Total	221.2	358.3

The Technology Development Program Budget (By Appropriation)

(\$ Millions)

<u>Appropriation</u>	<u>FY 1991</u>	<u>FY 1992</u>
AEDA*		
Operating	\$ 183.5	\$ 304.8
Construction	0.0	17.1
Equipment	16.8	17.5
Total	200.3	339.4
ESRD**		
Operating	0.5	0.0
Construction (EMSL)	5.2	0.0
Total	5.7	0.0
Total	206.0	339.4

* AEDA - Atomic Energy Defense Activity

** ESRD - Energy Supply Research & Development

The Technology Development Program Budget Summary

(\$ Millions)

	<u>FY 1991</u>	<u>FY 1992</u>
Integrated Demonstrations Under:		
Soil and Groundwater Cleanup	\$ 30.3	\$ 61.3
Waste Retrieval and Processing	77.0	124.3
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Environmental & Molecular Science Lab (EMSL)	5.2	17.1
Total	206.0	339.4

88

FY 91 - 92 Initiatives

Soils and Groundwater Cleanup FY '91 Initiatives

- **Integrated Demonstration (ID) at Full Operational Status**
 - VOC removal at non-arid sites (Horizontal wells SR)
- **Initiate Planning for Two IDs**
 - Cleanup of metals (non Pu/U) from soil
 - Toxic chemicals
- **Start Up Operation of Three IDs**
 - Pu removal from NV soils
 - VOC removal from arid sites
 - Characterization and testing for U removal from Fernald
- **Start Up of Two Integrated R&D Programs**
 - In situ remediation
 - Waste characterization and sensor development

Soils and Groundwater Cleanup FY '92 Initiatives

- **Expedite Four Integrated Demonstrations (IDs) at Full Operation:**
 - VOC removal at non-arid site (e.g., Bioremediation at SR)
 - Pu removal from NV soil (applicability to other sites)
 - Characterization and testing for U removal from Fernald
 - VOC removal from arid sites
- **Plan and Start Up of Four IDs:**
 - Cleanup of metals (non Pu/U, e.g., Cr)
 - Toxic chemicals
 - Non-VOC in non-arid sites
 - Non-VOC in arid sites
- **Expand R&D Emphasis Areas**
 - Containment technologies (e.g., Bio-immobilization, ISV, etc.)
 - Select chemically-sensitive fiberoptic sensors for underground tank waste analysis
 - Develop microbial and chemical tags for mapping contaminated soil

Waste Retrieval and Processing FY '91 Initiatives

- **OPERATE BURIED WASTE DEMONSTRATION**
 - INITIATE CHARACTERIZATION TESTING
 - EVALUATE RETRIEVAL SYSTEMS DESIGNS
 - CONDUCT VAPOR VACUUM EXTRACTION TESTING
 - INITIATE LARGE SCALE ISV FIELD TEST DESIGN
 - IDENTIFY IN SITU AND EX SITU TREATMENT TECHNOLOGIES
 - CONTINUE BIOREMEDIATION R&D
- **INITIATE PLANNING - 5 INTEGRATED DEMONSTRATIONS**
 - NEWLY GENERATED MIXED WASTE
 - RCRA WASTE
 - COMBUSTIBLE WASTE
 - IN SITU VITRIFICATION
 - ADVANCED PROCESSING
- **INITIATE START UP OF UNDERGROUND STORAGE TANK INTEGRATED DEMONSTRATION**
 - INITIATE GAS REMOVAL TECHNOLOGIES TESTING
 - INITIATE FULL SCALE UST ISV TEST DESIGN
 - INITIATE PROTECTIVE BARRIER TESTING
- **START UP OF TWO INTEGRATED R&D PROGRAMS**
 - RADIOISOTOPE SEPARATION AND PROCESSING
 - HAZARDOUS MIXED WASTE SEPARATION AND PROCESSING

Waste Retrieval and Processing

FY '92 Initiatives

- **CONTINUE OPERATION OF BURIED WASTE INTEGRATED DEMONSTRATION**
 - **CHARACTERIZE TEST SITE USING NEW TECHNOLOGIES**
 - **EVALUATE RETRIEVAL AND IN SITU/EX SITU PROCESSING TECHNOLOGIES**
- **START OPERATION OF UNDERGROUND STORAGE TANKS ID**
 - **EVALUATE WASTE CHARACTERIZATION TECHNOLOGIES**
 - **DEMONSTRATE GAS REMOVAL TECHNOLOGIES**
 - **INITIATE TESTING OF WASTE RETRIEVAL AND TREATMENT**
- **INITIATE PLANNING - 2 INTEGRATED DEMONSTRATIONS**
 - **D&D OF CONCRETE STRUCTURES**
 - **D&D OF METALS AND MATERIALS**
- **EXPAND RADIOISOTOPE SEPARATIONS AND PROCESSING INTEGRATED PROGRAM**
 - **DEVELOP NOVEL ION AND MEMBRANE SEPARATIONS FOR TRU WASTE**
 - **EVALUATE METHODS FOR NONDESTRUCTIVE ASSAY OF WASTE IN DRUMS**
 - **ASSESS RECYCLING OPPORTUNITIES FROM CONCENTRATED WASTE**
- **ENLARGE HAZARDOUS WASTE SEPARATIONS AND PROCESSING INTEGRATED PROGRAM**
 - **DEVELOP NOVEL APPROACHES, E.G., MICROWAVE-ENHANCED CATALYSIS AND MOLTEN SALT DESTRUCTION OF ORGANICS**
 - **TRANSFER MOST PROMISING MICROBIAL "MIXED WASTE" TREATMENTS TO DT&E**

Waste Minimization & Waste Reduction FY '91 Initiatives

- **TWO INTEGRATED DEMONSTRATIONS ATTAIN FULL OPERATIONAL STATUS**
 - **DEPLETED URANIUM WASTE MINIMIZATION AT Y-12**
 - **ENVIRONMENTALLY CONSCIOUS ELECTRONICS MANUFACTURING**
- **COMPLETE PLANNING FOR PLUTONIUM WASTE MINIMIZATION DEMONSTRATION AT ROCKY FLATS**

-Other ID Related FY '91 Initiatives

- **ROBOTICS**

- COMPLETE INTEGRATED ROBOTICS PLANNING FOR FIRST 4 SITES
- COMPLETE DESIGN OF AUTOMATED LABORATORY MODULES
- SUPPORT R&D ACTIVITIES IN NIST CONSORTIUM
- EVALUATE ADVANCED LIGHT ROBOTICS
- INITIATE UST RETRIEVAL SYSTEM DESIGN
- COMPLETE DESIGN OF Pu/U MACHINE DEMO
- SELECT OPTION FOR GLOVE BOX AUTOMATION
- SELECT HEAVY ROBOTICS FOR WASTE RETRIEVAL

- **DP/EM MOU**

- INITIATE PLANNING AND DEVELOP ROADMAP FOR MOU IMPLEMENTATION
- COMPLETE PROCESS LINE MODELING INITIATED IN FY 90
- EVALUATE LINE PROCESS MODEL
- TRANSFER SOLVENT SUBSTITUTION TECHNOLOGY TO DP SITES

- **DOE/AIR FORCE MOA**

- COMPLETE PLANNING FOR COOPERATIVE ACTIVITIES WITH THE AIR FORCE
- CONDUCT SOLVENT SUBSTITUTION AND METAL MANUFACTURING RESEARCH AND DEVELOPMENT

- **ANALYTICAL LABS**

- **HEPA FILTERS**

Other ID Related FY '92 Initiatives

• ROBOTICS

- INITIATE PROCUREMENT OF AUTOMATED LABORATORY MODULES
- FOCUS NIST CONSORTIUM ON FULL SCALE SYSTEM
- SELECT OPTION FOR ADVANCED LIGHT ROBOTICS SYSTEM
- INITIATE CONSTRUCTION OF UST RETRIEVAL SYSTEM
- INITIATE DESIGN OF AUTOMATED LABORATORY DEMONSTRATION
- INITIATE P&U MACHINING DEMONSTRATION
- INITIATE PROCUREMENTS FOR:
 - GLOVE BOX AUTOMATION
 - RETRIEVAL ROBOTICS SYSTEM
- CONTINUE EVALUATION OF LABORATORY AUTOMATION SYSTEM

• DOE/AIR FORCE MOA

- COOPERATION EFFORTS EXPANDED WITH OTHER AGENCIES
- IMPLEMENT DEMONSTRATED SOLVENT SUBSTITUTION TECHNOLOGIES
- EVALUATE ALTERNATIVE CLEANING PROCESSES
- DEMONSTRATE METAL MANUFACTURING TECHNOLOGIES

• ANALYTICAL LABS

Education FY '91 Initiatives

- **CONTINUE THE 2 PILOT PARTNERSHIPS AT NEW MEXICO AND SOUTH CAROLINA**
- **CONTINUE THE ACADEMIC PARTNERSHIP WITH THE HBCU/MI CONSORTIUM**
- **CONTINUE THE NATIONAL INTERACTIONS WITH UNIVERSITIES**
 - **MINORITY FELLOWSHIP/SCHOLARSHIP**
 - **FELLOWSHIPS**
 - **SCHOLARSHIPS**
 - **YOUNG FACULTY AWARDS**
- **EXPAND THE COMMUNITY COLLEGE INITIATIVES FOR TECHNICIANS**
- **EXPAND THE PRE-COLLEGE OUTREACH PROGRAM**

Education FY '92 Initiatives

- CONTINUE OPERATION OF 2 PILOT PARTNERSHIPS AT
 - NEW MEXICO
 - SOUTH CAROLINA
- CONTINUE HBCU/MI ACADEMIC PARTNERSHIP
- ADD UP TO FOUR ACADEMIC PARTNERSHIPS
- INITIATE NATIONAL EDUCATION CONSORTIUM TO LINK PARTNERSHIPS
- CONTINUE NATIONAL COMPETITION FOR STUDENT/FACULTY SUPPORT
 - MINORITY FELLOWSHIPS/SCHOLARSHIPS
 - FELLOWSHIPS
 - SCHOLARSHIPS
 - YOUNG FACULTY
- IMPLEMENT SYSTEM-WIDE RE-EDUCATION PROGRAM
 - SITE SPECIFIC
 - INNOVATIVE TECHNOLOGIES
- EXPAND OUTREACH ACTIVITIES ON A NATIONAL SCALE
- LINK WITH PROFESSIONAL SOCIETIES TO IMPROVE PUBLIC AWARENESS

Transportation FY '91 Initiatives

- **INITIATE ACTIVITIES REQUIRED FOR ENVIRONMENTAL IMPACT STATEMENT**
- **CONTINUE HAZARDOUS AND MIXED WASTE PACKAGING NEEDS ASSESSMENT**
- **BEGIN OPERATIONAL NEEDS ASSESSMENT**
- **START DEVELOPMENT OF AUTOMATED TRANSPORTATION MANAGEMENT SYSTEM WITH MOTOR CARRIERS**
- **INITIATE A STUDENT INFORMATION PROGRAM**
- **INITIATE DEVELOPMENT OF STANDARDIZED INFORMATION AND COMMUNICATIONS TRAVELING PROGRAM**
- **INCREASE INSTITUTIONAL PROGRAM EFFORTS ON ISSUE RESOLUTION, URBAN GROUP ACTIVITIES, TRIBAL INTERACTIONS, AND WIPP SUPPORT**
- **PLAN AND BEGIN IMPLEMENTATION OF EMERGENCY PREPAREDNESS TRAINING AND EXERCISE PLANNING**
- **COMPLETE DEVELOPMENT OF PACKAGING READINESS INFORMATION SYSTEM**
- **COMPLETE THE MOBILE INSTRUMENTATION SYSTEM FOR RAM PACKAGING TESTS**
- **COMPLETE MOSAIK KFK DUCTILE CAST IRON CASK DROP TESTS**

Transportation FY '92 Initiatives

- **CONTINUE NEPA ACTIVITIES**
- **COMPLETE PACKAGING NEEDS AND ASSESSMENT AND BEGIN PACKAGING DEVELOPMENT**
- **CONTINUE OPERATIONAL NEEDS ASSESSMENT**
- **BEGIN TESTING ATMS**
- **IMPLEMENT STUDENT INFORMATION PROGRAM**
- **COMPLETE DEVELOPMENT OF INFORMATION AND COMMUNICATIONS TRAVELING PROGRAM**
- **SUPPORT NEPA ACTIVITIES THROUGH PUBLIC INVOLVEMENT PLANNING AND SCOPING MEETINGS**
- **INITIATE A STATE EMERGENCY PREPAREDNESS SUPPORT PROGRAM**
- **PREPARE A DESIGN GUIDE FOR SELECTING SUITABLE PACKAGE SEAL CONFIGURATION**

Soil and Groundwater Cleanup

(\$ Millions)

Integrated Demonstration

	FY 1991	FY 1992
SRS Ingrated Demonstration	\$ 15.0 ^O	\$ 30.0 ^O
PU Contaminated Soils	5.3 ^{PS}	15.0 ^O
U Contaminated	5.0 ^P	5.0 ^S
Unsaturated Soil Cleanup (Arid Sites)	5.0 ^P	5.0 ^S
Non-PU/U Metals in Soil		2.1 ^{PS}
Toxic Chemicals		2.1 ^{PS}
Non-VOC in Saturated Soils		1.1 ^P
Non-VOC in Unsaturated Soils		1.0 ^P
Total	30.3	61.3

P - Planning

S - Startup

O - Fully Operational

Waste Retrieval and Waste Processing

(\$ Millions)

Integrated Demonstration

	FY 1991	FY 1992
Buried Waste Program	\$ 30.0 ^{PSO}	\$ 30.0 ^O
Underground Storage Tanks	19.0 ^S	25.0 ^O
Robotics	12.0 ^S	20.0 ^O
Newly Generated Mixed Waste	2.0 ^P	7.0 ^S
RCRA Waste	9.0 ^P	14.3 ^S
Combustible Waste	1.0 ^P	8.0 ^S
Decontamination & Decommissioning of Concrete Structures		5.0 ^{PS}
Decontamination & Decommissioning of Metal Structures & Materials		5.0 ^{PS}
In Situ Vitrification	2.0 ^P	6.0 ^{PS}
Advanced Processing	2.0 ^P	4.0 ^{PS}
Total	77.0	124.3

P - Planning

S - Startup

O - Fully Operational

Waste Minimization and Waste Reduction

(\$ Millions)

Integrated Demonstration

	FY 1991	FY 1992
Depleted Uranium Waste Minimization at Y-12	\$ 16.0 ^O	\$ 0.0
Plutonium Waste Minimization at Rocky Flats	1.0 ^P	0.0
Environmentally Conscious Electronics Manufacturing	3.0 ^O	0.0
DP/EM MOU	15.0 ^{SO}	0.0
DOE/Air Force MOA	2.0 ^O	5.0 ^O
Non-radioactive Components Manufacturing		5.0 ^O
General Waste Minimization		4.1 ^P

Total

37.0

14.1

P - Planning

S - Startup

O - Fully Operational

Education Development & Technology Integration

(\$ Millions)

<u>Program/Activity</u>	<u>FY 1991</u>	<u>FY 1992</u>
Education Development	\$23.0	\$42.8
Technology Integration	4.0	15.0
	27.0	57.8

Program Support
FY 1991 and FY 1992 Program Budget Summary

(\$ Millions)

<u>Program/Activity</u>	<u>FY 1990</u>	<u>FY 1991</u>
Management & Administration (Risk Management, International Program, Cost Savings, Cost Analysis)	\$ 5.0	\$ 7.0
Program Support (Support Services, Support Staff (detailees))	4.0	5.4
Analytical Laboratory Management	6.0	15.0
Field Support (TPO/TPM, Workshops, etc.)	4.3	6.0
	19.3	33.4

Program Support Analytical Lab Management

(\$ Millions)

Analytical Laboratory Management	FY 1990 <u>Actual</u>	FY 1991 <u>Appropriation</u>	FY 1992 <u>Request</u>
Program areas to be developed in 1991	\$ 1.0	\$ 6.0	\$ 15.0
- Laboratory analysis of hazardous, radiological, and mixed waste — Methods development & standardization — Strategies for cost effective capacity — Sample tracking systems — Data base development - QA/QC programs for credible DOE decisions that reassure compliance agencies and the public — Oversight of DOE & private labs — Lab accreditation & auditing — Data validation — Interagency QA coordination			

Environmental & Molecular Science Laboratory (EMSL)

(\$ Millions)

	<u>FY 1991</u>	<u>FY 1992</u>	<u>TEC *</u>
• EMSL, RL (91-EM-100)	\$ 5.2	\$ 17.1	\$ 135.2
• Fully equipped and integrated research facility			
• Exploration of biological concepts for destruction of hazardous organic compounds			
• Definitive facility design in FY 1991			
• Start of construction in FY 1992			

* TEC - Total Estimated Cost

Transportation Management Program (By Appropriation)

(\$ Millions)

<u>APPROPRIATION</u>	<u>FY 1990</u>	<u>FY 1991</u>	<u>FY 1991</u>
AEDA*			
Operating	\$ 11.6	\$ 14.7	\$ 18.2
Equipment	0.5	0.5	.7
Total	12.1	15.2	18.9

* AEDA – Atomic Energy Defense Activity

Mr. SCHEUER. Dr. Frank, I'm going to ask you one question and then I'm going to recess for this roll call vote that's ongoing. As soon as Congressman Wolpe gets back, he will chair so we won't waste your time while I go across and back.

Dr. Frank, in my letter inviting you to testify I said, "Your testimony should address in particular the process for setting research and development priorities, the technologies developed under the Technology Development Program."

The Committee is very much interested, Dr. Frank, in how the priority-setting process is linked to the most serious risks to human health and the environment as a result of contamination at DOE facilities, yet in your written testimony you made no reference whatsoever to the priorities which DOE applied to determine which technologies will be developed to address specific contamination problems.

Now I would like you to respond to us and shed some light on your priority-setting process by answering a couple of specific questions. Okay?

Dr. FRANK. Yes, sir.

Mr. SCHEUER. First, what is or what was the—and you might make a note or two because I have three or four questions. I'm going to ask them all at once and you can take a pass at them.

What was or is the process used to set priorities for technology development? Which office of DOE is responsible for setting these priorities? What are the priorities as they have emerged? Are they the precise priorities as—are they precisely the same priorities as those for environmental restoration and waste management for that program? What is the role of the Environment, Safety, and Health Office in setting priorities? Does the ES&H office then ensure that these priorities are followed in the Technology Development Program? And how do the accomplishments, which you have listed in your attachment I, reflect these priorities?

We've been joined, incidentally, by Congressman Sid Morrison from the State of Washington. We're delighted to have you join us.

Dr. FRANK. I will try to briefly answer those questions.

The Environmental Restoration and Waste Management Program has two programmatic prioritization systems that are under development, one for waste management and one for environmental restoration. The environmental restoration prioritization system is certainly more sophisticated.

Mr. SCHEUER. I've tried to avoid that awful word that is an assault on the English language—prioritization. Can we say "priority-setting", "priority establishment"?

Dr. FRANK. I'll write that down, sir.

Mr. SCHEUER. There are two words that I've learned since I've come to Congress that I absolutely abhor—this is off the record.

[Laughter.]

Mr. SCHEUER. One is prioritization, and the other is incentivization.

[Laughter.]

Mr. SCHEUER. As I frequently explained to my children 30 years ago, and as I know frequently explain to my grandchildren, the English language is the only thing that separates us from the beasts in the jungle.

[Laughter.]

Mr. SCHEUER. So with your indulgence, let's not assault the English language any further this afternoon with either of those two words.

Thank you, and I beg your pardon for this rude intercession.

Dr. FRANK. I will practice priority-setting. I will take it back to the Department.

Mr. SCHEUER. Doctor Frank, I have to go to answer that roll call vote. You can either wait until Congressman Wolpe gets back, or you can continue to talk for the record, and we'll examine the hearing record, whichever you prefer.

Dr. FRANK. I'll wait.

Mr. SCHEUER. Okay.

[Recess.]

Mr. WOLPE. The hearing will resume.

I understand that Congressman Scheuer had asked a series of questions that I think he might like to be present in order to hear the responses to. With your indulgence, therefore, I wonder if we can put those questions aside so that I take this opportunity to ask a few questions of my own. I also must testify in front of the Rules Committee in a few minutes, so it turns out to be an opportune moment for me, at least. I hope it is agreeable to you.

In the mid-1980s, Dr. Ziemer, the Department of Energy initiated an Environmental Survey Program to obtain a baseline snapshot of environmental conditions at all of its facilities. This was an expensive but obviously quite necessary undertaking. What was the total cost of that program?

Dr. ZIEMER. Could I be permitted to put that in the record later? I do not have those figures with me.

Mr. WOLPE. I believe that you have with you today—

Dr. ZIEMER. I could ask them to give me those figures. My budget person is here.

\$60 million to \$65 million is Mr. Berube's estimate of that cost.

Mr. WOLPE. Okay.

A critical part of the program was the sampling and analysis effort which was intended to help quantify the environmental problems of each facility and to serve as a part of the basis for establishing the priorities for DOE's cleanup program. What was the cost of that particular effort?

Dr. ZIEMER. Approximately 90 percent of the total previously mentioned was directed toward that effort.

Mr. WOLPE. So about \$54 million.

So over 80 percent—or 90 percent of the cost of the Environmental Survey Program was the sampling and analysis.

Presumably, the Department of Energy conducts sampling and analysis at each of its facilities all the time. I suppose the Department of Energy in this instance thought that additional sampling was necessary in order to assure uniform data and to get some information the regular testing programs would not provide. Is that correct?

Dr. ZIEMER. Again, let me call on Mr. Berube, because you're referring to items that occurred long before I joined the Department.

Would you like to join me at the table for a second?

Mr. WOLPE. Why doesn't Mr. Berube just simply come to the table for a couple of minutes here.

[Laughter.]

Mr. WOLPE. It might be a little bit easier.

Could you just identify yourself for the record, please?

Mr. BERUBE. Yes. My name is Ray Berube. I'm the Deputy Assistant Secretary for Environment at the Department of Energy. I am a long-term career employee at the Department of Energy and have seen many changes in the Department over the 13 years that I've been there.

In response to your question regarding the sampling and analysis and the purpose behind that program—at the time that the survey was initiated—and that was actually going back to the late 1985 time frame of this program—the first survey was conducted at our facility at Fernald, Ohio in June of 1986. At that time, throughout the DOE complex there was a situation where we had uneven levels of information so that it was very difficult for the Department—and the new Administration that was taking over at that time—to have an appreciation of where the most serious problems were. The underlying purpose behind that sampling and analysis program—a very costly program—was to give the Department some handle on where the serious problems were.

Mr. WOLPE. Okay.

To date, all of the site specific reports called—as I understand it—the preliminary survey reports have been released, but did not incorporate the results of the sampling and analysis program that you've just described. Is that correct?

Mr. BERUBE. That's correct. That was the case for a number of reasons. First, what we later called the preliminary survey report was never a part of the original design of the survey program. At the time that was designed, to be quite honest, this whole area was kind of new to the Department of Energy. We have learned a lot since then.

We had envisioned a program where we'd go out and do the field work—the inspection, the observation of operations—to be followed shortly thereafter by this sampling and analysis program. And we anticipated a duration of 10 to 12 weeks for that program and almost immediate turnaround on the results so that we could then issue a final report—or a report—for each site.

Now, as the real world descended on us, those schedules proved to be not very realistic at all. On the other hand, we were being driven by a number of different interests—legitimate interests—to share the information at least from what amounted to be the audit portion of that survey. So that was the genesis of what would later be called the preliminary survey reports. We wanted to get that information out.

The sampling and analysis effort became very involved in terms of time and in fact in some cases it took over a year to actually conduct the sampling at the site, get all the analysis results returned, and also there were lots of problems with respect to the analysis of those samples done at the various DOE labs. It was not an easy program.

Mr. WOLPE. That's the piece that I want to get to in just a moment.

In late 1988, the Department of Energy released the Environmental Survey Preliminary Report, which ranked all of the environmental problems in the DOE's weapons complex with the results of the sampling and analysis program incorporated into that report.

Mr. BERUBE. Only in a very indirect general way. The simple answer to the question is no.

Mr. WOLPE. Presumably it will be incorporated into the final report, which I understand was to have been completed by the fall of 1989.

Mr. BERUBE. Right. Yes. That was the original schedule in plan, but there have been a number of new developments that have affected that plan, quite honestly.

Mr. WOLPE. So that required—the one that was to be out in 1989?

Mr. BERUBE. No, it was not released in 1989, and it still is not completed. What form it may take, I'm not certain.

But let me explain why. Again, there have been a number of developments that have taken place since the original planned schedule for the survey was conceived, which again goes back to 1985. The resources we use—when I say “we”, it's ES&H, in the internal oversight organization—to conduct the survey, and we envisioned to used to complete the survey, were the same resources that the Department has applied to Admiral Watkins' Tiger Team initiatives and some other activities like that. We haven't dropped it, but we have deferred work on completing that.

In addition, this whole concept—and I run the risk of angering the Chairman if I use the word “prioritization”, so I'll say priority-setting—is not an easy task. That is essentially what we're talking about with respect to the survey ranking system.

Mr. WOLPE. Are the Tiger Teams doing sampling and analysis?

Mr. BERUBE. No, they are not.

Mr. WOLPE. They are not?

Mr. BERUBE. With the exception of Rocky Flats, we did a small amount—Rocky Flats preceded the Secretary's announcement of Tiger Teams, but in effect was a Tiger Team. We did a small amount of sampling and analysis at Rocky Flats. I don't believe we've done it at any other site, but let me check.

[The information follows:]

Tiger Team Compliance Assessments completed to date have not included sampling and analysis, except at the Rocky Flats Plant.

Mr. WOLPE. If I understand the implication of what you're saying here, it's troubling, to say the least. You have acknowledged investing \$50 million into the sampling and analysis effort. The results of that sampling and analysis effort were not incorporated into either of the preliminary survey reports or in the Environmental Survey Preliminary Report. The final report has even not yet been released, but you're suspending that element of the report relating to sampling and analysis. So in other words, this \$50 million does not seem to have had any productive consequence whatsoever.

Mr. BERUBE. Mr. Chairman, if I have left you with that troubling impression, then I have not explained that very well.

That is not the situation—clearly not, from my perspective. The Environmental Survey, in my judgment, has delivered benefits well beyond its cost with respect to the many improvements that have

The Transportation Management Program Budget (By Operations Office)

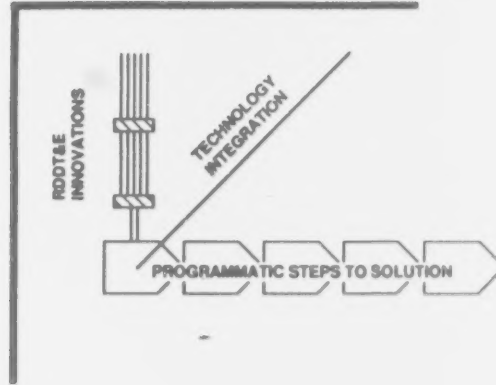
(\$ Millions)

<u>Operations Office</u>	<u>FY 1991</u>	<u>FY 1992</u>
Albuquerque	\$ 5.8	\$ 7.7
Chicago	0.2	.2
Headquarters	2.0	1.9
Nevada	0.2	.3
Oak Ridge	3.4	5.0
Richland	3.6	3.8
Total	15.2	18.9

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already occurred throughout the DOE system. To a large extent, it was through the Environmental Survey Program that most of these environmental problems the DOE Sites came to surface in a public arena through a series of congressional hearings and other forums. And all of that has led to a much greater sensitivity to environmental compliance and environmental protection.

The original concept that the last Administration had with respect to that survey concept, quite honestly, may have been overtaken by events, very positive and very favorable events.

Mr. WOLPE. Well, that doesn't nonetheless negate the fact that this \$50 million may not have been well spent.

You mentioned that there were some problems with the sampling.

Mr. BERUBE. There were problems at the National Labs that the Department of Energy used and the analysis of the samples that were taken, yes.

Mr. WOLPE. Did those problems with the samples and the analyses have something to do with the delays in the incorporation of these data in these other various reports?

Mr. BERUBE. Those problems, again, didn't delay the issuance of the preliminary reports because those preliminary reports did not depend on the sampling and analysis data.

Now, the analysis—or the problems that we had at the labs did lead to some delay, but not with respect to the final report of the Survey Program. That is just being delayed right now, quite honestly, by having to attend to other priorities.

Mr. WOLPE. You referred to the prioritizing effort. Wasn't it the initial assumption that the reason for undertaking—that the sampling and analysis results would play into the establishment of priorities? Wasn't that one of the major reasons for undertaking the analysis in the first place, or you would not have spent the \$50 million, presumably?

Mr. BERUBE. Again, going back to the 1985 time frame, when this was planned—and actually had I known, we could have submitted in advance I think some detailed explanations for all this. I'm relying on memory right now. I would like to point out that I wasn't in total charge of the Department of Energy at that time.

Mr. WOLPE. I'm not singling you out here. I'm just trying to understand whatever happened to all this money.

Mr. BERUBE. The Administration that took over in the 1985 time frame was aware that there was a large legacy of environmental problems throughout the DOE system, but for the most part it was an undefined legacy. The survey was intended to help define one aspect of that, and more specifically with respect to contamination of soil and groundwater at the various DOE facilities.

That is not the full universe of environmental problems that the DOE has to contend with. We also have many compliance problems, and in addition there are many environmental problems associated with facilities not directly related to either soil or groundwater contamination.

So, again, the survey was going to help define one aspect of this.

Mr. WOLPE. I don't mean to interrupt, but I just want to keep the focus on one piece of this right now because my time is coming to

an end because I'm exhausted so I yield to Mr. Morrison just momentarily here.

Isn't it true that the Department of Energy's Inspector General reviewed the Sampling and Analysis Program undertaken by the National Laboratories and precluded that there were serious technical problems with that work?

Mr. BERUBE. There were some findings made by the Inspector General regarding deficiencies in the labs analytical work. And in most cases we agreed with those findings.

Mr. WOLPE. How much of that \$50 million effort, therefore, is no longer in effect, credible data that can be used—

Mr. BERUBE. I'm sorry, but—from my perspective, again, the sampling and analysis work that was done—the Department got back its investment.

Mr. WOLPE. That wasn't my question. How much of the work that was done is not in fact useful because of the technical problems that in fact were identified?

Mr. BERUBE. The only thing along those lines that was actually identified—and I don't have a number in my memory now—was a small amount of work—relatively small—at the Oak Ridge National Lab. We can provide for the record the amount.

[The information follows:]

Oak Ridge National Laboratory analyzed a total of 1687 samples as part of the Sampling and Analysis effort of the Environmental Survey.

A total of 291 samples were determined by staff in the Office of Environmental Audit to be "unsuitable for use by the survey" (estimated cost-\$582,000).

Mr. BERUBE. But, again, I feel right now that I'm giving you a incomplete picture, and I would like the opportunity to explain more fully for the record—

Mr. WOLPE. We would welcome any material that you would like to submit for the record. I'm simply trying to understand, though, what happened to this particular issue. There may be lots of explanations for it. The bottom line— if I understand what you're telling us—is that indeed much of the work, or some portion of the work of the National Laboratories was not done in a way that was particularly useful.

You're telling us also that the sample work that was done and which was supposed to have been incorporated in various reports that were to help in the establishment of priorities and all the rest, that that has not happened. You're saying the reasons for it—fine. But the bottom line is that much of that work has not yet been applied in the way in which most people thought it was to be applied.

My last question that I would put to you—was there any consideration given to subcontracting this work out in a competitive process to people that may have been more equipped at this point than the National Laboratories were at that point to undertake this kind of work?

Mr. BERUBE. In the early 1985 time frame, there was consideration given to contracting out with a number of different labs. If I could use this opportunity, though, your summation of my answers—with all due respect—if that's what I'm leaving you with, again, I'm not explaining this very well.

The data that was generated was used and is useful for the most part. It was used by the various DOE sites in their preparation of site plans that have now become the Five Year Plan for Waste Management and Environmental Restoration. It is serving many other purposes than were originally intended.

So, again, I think you're being provided snapshots of problems. I will readily admit to a number of problems associated with that program. That is not unique to DOE, believe me. EPA is having the same problems. But I don't believe—and if I sound too defensive on this, I apologize.

Mr. WOLPE. You do.

[Laughter.]

Mr. BERUBE. As a taxpayer, I'm concerned about the Government's use of the money, too. I think to adequately explain this—again, I would ask for the opportunity to do that in the record. I'm obviously not accomplishing that right now.

Mr. WOLPE. Fine.

In that accounting—I have no more questions—but I would hope that—I would ask that the Department of Energy would provide to the Committee some—a complete accounting of the program, its status, the extent of problems with the Sampling and Analysis Program, how much of the \$50 million are reflected in those problems, what use we'll be able to make of the data that has been compiled, and when the Department of Energy will in fact complete this project.

I do have some concerns that I should indicate. Cleaning up these facilities is going to be a very expensive proposition. It's absolutely critical that we do this, and we do this well, and that the public has some confidence that the billions of dollars that are going to be dedicated to this effort are being properly managed and well-accounted for. This is just the first phase of this entire process. There are some serious questions, in my view, with the way it has occurred. I look forward to receiving your fuller written exposition.

Mr. BERUBE. Thank you for that opportunity.

[Material referred to follows:]

DEPARTMENT OF ENERGY
ENVIRONMENTAL SURVEY PROGRAM

APRIL 1991
OFFICE OF ENVIRONMENTAL AUDIT

Background

The U.S. Department of Energy (DOE) Environmental Survey Program, a program in which comprehensive Environmental Surveys were conducted at DOE's major operating facilities, was announced and implemented in September 1985. The program was one of several initiatives announced that year intended to strengthen DOE's environment, safety and health (ES&H) functions and bring its facilities into compliance with applicable Federal, state, and local environmental and safety requirements. Before these initiatives were implemented, compliance with environmental requirements at DOE facilities was often poor or undetermined, and insufficient information was available to define the environmental problems and associated vulnerabilities from past operations.

The other initiatives announced with the Environmental Survey Program included: 1) reorganizing and upgrading the ES&H functions under the direction of a new Assistant Secretary for Environment, Safety and Health, 2) conducting multidisciplinary Technical Safety Appraisals of DOE's high and moderate hazard nuclear facilities, and 3) developing a Computer-Assisted Tracking System to enable the ES&H organization to monitor the status of DOE operations and assist DOE in managing and reducing areas of risk. Collectively, these initiatives made it possible for DOE to begin correcting the problems at its facilities caused by years of inattention to ES&H concerns.

Purpose

The Environmental Survey was fundamentally an internal DOE management tool designed to facilitate long-range planning and efficient allocation of limited resources. Its purpose was to identify environmental problems and areas of environmental risk at DOE operating facilities so they could be prioritized for remedial action.

Another purpose of the Survey was to develop a baseline of environmental information for each major DOE operating facility. Such baseline information was clearly necessary, based on the wide diversity of facilities and environmental issues within the DOE complex. It would allow DOE to measure and validate future environmental performance at its facilities. It could also be used to establish priorities, utilizing the background information, for a future environmental audit program within DOE.

The Survey was not intended to replace the ongoing efforts of DOE Operations Offices and facilities to characterize and correct environmental problems and achieve environmental compliance; it was intended to complement their efforts. The prioritization scheme, developed as part of the Survey, was not intended to be the sole criterion for planning and management decisions, but rather a tool to be used in evaluating criteria relevant to correction of DOE's environmental problems. It was to be the first step toward establishing a continuing, dynamic system of assessing priorities for environmental cleanup based on a constantly changing body of information.

Design and Approach

The Environmental Survey was designed to include a review of 35 major DOE operating facilities (Attachment 1) over approximately three years, beginning in June 1986. At each facility, the Survey investigated environmental media, including air, surface water, groundwater and soil, and the major environmental laws and regulations, including the Clean Air Act; Clean Water Act; Resource Conservation and Recovery Act; Comprehensive Environmental Response, Compensation, and Liability Act; Safe Drinking Water Act; Toxic Substances Control Act; and the Federal Insecticide, Fungicide and Rodenticide Act.

The investigations were conducted to identify environmental problems and risks, which were defined to include the following:

- . pollutants or contaminants in the air, surface water, groundwater, or soil resulting from DOE operations that pose or may pose a hazard to human health or the environment; and
- . conditions at DOE facilities that could potentially cause the release of pollutants or contaminants to the environment in a manner that may pose a hazard to human health or the environment.

The Survey was not conducted as a routine environmental audit where facilities are reviewed for current compliance against environmental regulations. The Survey was designed to identify such regulatory compliance issues only to the extent that they constitute an environmental problem or risk.

The Survey was also designed, and implemented, on a "no fault" basis. It was conducted with the presupposition that there were many environmental problems at DOE facilities that were "legacies of the past." These legacies resulted from activities conducted in a previous public/political climate, and according to standards, much different than those in effect today. In the interest of compiling as complete an inventory of environmental problems as possible, the Survey was structured so that findings were not necessarily a reflection on current site managers.

Those current site managers were, however, given the responsibility of correcting or mitigating the identified problems.

The Survey was managed by the Office of Environmental Audit under the Assistant Secretary for Environment, Safety and Health. It was implemented using five teams led and managed by a DOE Team Leader and Assistant Team Leader. Each team consisted of 7 to 10 members and included outside experts on environmental media and environmental statutes. Areas of technical specialty included air, surface water, groundwater, radiation, waste management, inactive waste sites, toxic substances, and quality assurance.

The Survey was conducted in accordance with the DOE Environmental Survey Manual (DOE/EH-0053), which contains the protocols and procedures for the program. The manual includes technical checklists, sampling and analysis protocols, criteria for data acceptance, report contents and formats, and guidance and instructions on identification of environmental problems. The sequence of events established in the original design for Survey activities at each facility is as follows:

1. Pre-Survey Planning and Preparation. Planning and preparation activities included review of readily available site information and data, review of information compiled by the facility in response to the information request letter sent by the DOE Team Leader, conduct of a 1- to 3-day pre-Survey site visit by representatives of the Survey Team for orientation planning of Survey Team on-site activities, meetings with regulatory agencies, and development of a detailed Survey plan which included discussions of issues identified, agendas, and required records.
2. Survey Team On-Site Activities. Depending on facility size and complexity, on-site activities lasted 1 to 3 weeks, and included observation and inspection of operations and facilities, interviews with facility personnel, and review of additional documentation.

-4-

3. Environmental Survey Preliminary Report. Following on-site activities, the Survey Team prepared a preliminary report of the tentative findings for each site.
4. Sampling and Analysis (S&A). S&A activities were conducted by DOE's national laboratories subsequent to the Survey Team on-site activities based on a plan developed by the Survey Team. The S&A effort was designed to be of a "reconnaissance" nature rather than be used for site characterization. It also was designed to assist the Survey Teams in identifying or better evaluating environmental problems and areas of environmental risk. Survey sampling activities were designed to make maximum use of existing site environmental data; additional sampling and analysis were conducted to fill information gaps.
5. Environmental Survey Interim Report. An interim report was to be developed to reflect the results of S&A activities. Additionally, it was intended to present final findings based, in part, upon review of the preliminary report. DOE ultimately decided to forego issuance of Interim Reports and move directly to the Environmental Survey Final Reports.
6. Environmental Survey Final Reports. The Final Reports were intended to compile and present an analysis of information collected at the 35 facilities included in the Survey program. The Final Reports, which are currently in preparation, will include a catalog of all environmental problems identified at the sites and a prioritization of those problems (discussed further below). Each report will focus on a specific facility to ensure optimal utility of the information.

During the Survey program, several changes occurred related either to the process set forth in the Environmental Survey Manual or the scope of its implementation. These changes were made to improve the products of the Survey or to reflect changing circumstances within DOE. Discussions of four of these changes follow.

1. Expansion of S&A Efforts. The scope of S&A activities was significantly expanded. The original design of the Survey assumed that at least some data would be available on most environmental problems. That assumption proved to be incorrect; many problems had virtually no existing data.
2. Cancellation of Interim Reports. As previously noted, DOE elected not to publish Interim Reports for each site as originally intended. Instead, the revisions to findings, which reflect S&A information and technical accuracy reviews, are being incorporated into the site-specific Final Reports.

3. Response to Public Interest in DOE's Weapons Production Facilities. In September, 1988, DOE issued a Preliminary Summary Report of the Defense Production Facilities (DOE/EH-0072). This report was prepared in response to the high degree of interest in environmental problems at DOE's weapons production facilities. Although data resulting from S&A efforts were not available at the time, it was important that the audit portion of the survey not be delayed. That report included a preliminary ranking and prioritization of environmental problems at DOE's 16 weapons production facilities based on site provided data or documented reasonable assumptions. The risk-based preliminary rankings for environmental problems at the defense production facilities were represented by a Hazard Potential Index (HPI) based on a calculated risk to potentially affected populations. The HPI was generated by a computer model, the Multimedia Environmental Pollutant Assessment System (MEPAS). This preliminary ranking effort proved useful in that it provided some early information on the most visible of DOE's environmental problems. Additionally, it identified areas of needed improvement, including the need for the collection of more data through the S&A program and the need to improve the prioritization process. Further discussion on this process and the resulting changes is provided below.
4. Action Plan Requirements. DOE determined that its field offices and operating contractors should prepare action plans setting forth how each Survey finding included in the preliminary report would be addressed. The action plans were required to contain information on actions to be taken, budgets and schedules for completion of the corrective actions, and to be submitted to the Assistant Secretary for Environment, Safety and Health for review.

Categorization and Prioritization of Environmental Problems

The objective of the Survey categorization and prioritization efforts was to systematically group problems according to environmental risk. As such, the Survey is not merely a collection of baseline environmental information; it can be used as a planning and management tool. The first step in the process is categorization. Survey findings were placed in one of four categories based generally on the hazards they pose, the amount of available information, and the budgetary implications of remedial action.

- Category I findings identify situations that pose an existing or imminent threat to human life and require an immediate response.
- Category II findings involve noncompliance with regulatory procedures or standards and environmental problems that relate to environmental or human health effects and, because of the risk presented, require response before the entire Environmental Survey is concluded.
- Category III findings, because of the lesser risk they pose and the budgetary commitments necessary to correct them, will be prioritized at the end of the Survey process. There is generally less available information on Category III findings than on Categories I or II; these findings are more likely to be the subject of sampling and analysis.
- Category IV findings include noncompliance (primarily administrative, technical or procedural in nature) with applicable regulations and DOE Orders, as well as unacceptable operational practices. Category IV findings are indirectly related to environmental risk and are susceptible to quick resolution. Information on these findings is essentially complete and, therefore, additional sampling and analysis or further study are not required before final corrective action may be taken.

The second step in categorization/prioritization is a ranking according to risk of the environmental problems (or ranking units) identified in Category III. Also included are Categories I and II findings that require additional action (i.e., those that were not immediately corrected). As originally designed, the ranking was to be accomplished by evaluating each environmental problem using the MEPAS model. Those risk-based rankings would be modified to account for such environmental concerns as compliance with environmental standards, enforcement actions, state and local concerns, and environmental degradation. While conducting the Survey, the approach was modified by the development of the DOE Risk Information System (RIS).

As in the original Survey design, the first part of the ranking process of RIS (Mechanistic Phase) involves application of the MEPAS model. MEPAS is based on standard mathematical algorithms that are used to predict the potential for 1) release of contaminants into the environment; 2) contaminant transport through and between multiple environmental media; 3) exposure to surrounding populations; and 4) impacts associated with exposure.

Output from MEPAS is used to indicate potential environmental concentrations and public health impacts. In addition to magnitudes, MEPAS provides information on the type, time, and location of impacts.

The second step (Judgmental Phase) of the RIS process builds upon the output from MEPAS. The Judgmental Phase is an adaptation of the Analytic Hierarchy Process (AHP) originally developed for the Environmental Protection Agency (EPA). The modified AHP process draws upon the expertise and judgments of experts to determine how the information developed in the Mechanistic Phase should be used to rank DOE's problems. The judgments and associated rankings were established through a 4-day consensus process by an Integration Panel comprised of environmental managers from throughout the DOE complex. The Panel also included observers from EPA and an independent public health risk expert. The results of the RIS process will be presented in the Environmental Survey Final Reports.

Benefits of the Environmental Survey

For most DOE facilities, and for the DOE complex, the Survey has represented an awakening of environmental responsibility. It served to define the legacy of environmental problems created over decades of DOE operations. More importantly, the Survey placed the need for cleanup and corrective action on the national agenda. Evidence of this includes the extraordinary attention from Congressional oversight committees these actions have received and a Washington Post editorial (December 14, 1988) on DOE's Preliminary Summary Report of the Defense Production Facilities. That attention has resulted in additional resources being made available through the DOE budget to correct these problems. A much greater sensitivity to environmental compliance and protection has developed at DOE.

The Survey has produced tangible results as well. The process of preparing for Survey visits resulted in the correction of many of the smaller environmental problems. The Survey provided the first level of awareness of environmental problems and regulatory concerns for DOE field personnel. It focused attention on significant efforts to identify and correct those problems of which field personnel previously had only a very general understanding. Implementation of action plans developed in response to Survey findings has resulted in the correction of or initiation of remedial actions for many more problems. In many cases, subsequent Tiger Team Assessments verified that corrective measures were taken regarding problems identified by the Survey.

The Survey was also the first hands-on DOE Headquarters look at field operations from an environmental perspective. Before the Survey program, Headquarters had an understanding of field safety activities as a result of the Technical Safety Appraisal Program. However, there was not a similar program for environmental activities. The Environmental Survey filled that void, thus resulting in Headquarters personnel becoming aware of field office compliance issues within the full range of environmental regulations and requirements.

Action plans developed in response to the Survey were the single most important source of input into the original DOE Environmental Restoration and Waste Management (EM) Five-Year Plan. The Five-Year Plan is an integrated planning tool which sets forth DOE activities to correct historical contamination and improve waste management practices. Having seen the result of past inattention to environmental issues, most facilities have modified operations and practices to reduce ongoing and potential releases.

The Survey has also provided several other indirect benefits to the EM program. The concept of prioritizing and ranking environmental problems based on risk and other pertinent concerns is directly relevant to fulfillment of EM responsibilities which must be accomplished in a resource-constrained setting. While the process employed by EM is different, the lessons learned through the RIS process have contributed to DOE's ability to make informed decisions on cleanup priorities.

In addition, the EM organization has instituted an aggressive plan for technology development in the areas of cleanup and waste management. The definition of DOE problems available through the Survey has allowed that program to focus immediately on technologies necessary for the most important and most prevalent environmental problems.

The Environmental Survey has also benefitted DOE's "Tiger Team Assessments," which are comprehensive assessments of ES&H compliance and management at DOE facilities. Those assessments, which began in 1989, are conducted in accordance with a process that was adapted from the Environmental Survey program. Further, the Survey served as a tool in prioritizing sites for Tiger Team Assessments. The Survey also resulted in the first comprehensive accumulation of site information in a single document (i.e., Environmental Survey Preliminary Report). As such, it is the primary source of data and background information used in preparing for Tiger Team Assessments.

Benefits of the Survey Sampling and Analysis Program

The S&A program, implemented as part of the Environmental Survey, has been scrutinized by DOE and external reviewers. The S&A Program was implemented in 1986 by four DOE laboratories. These laboratories provided the field sampling teams and analytical laboratory support, and EPA's Environmental Monitoring System Laboratory-Las Vegas (EMSL-LV) provided quality assurance and quality control (QA/QC) support to DOE.

The S&A program was a major undertaking for DOE. Before the Survey S&A efforts, DOE laboratories were largely geared toward research support and not the volume of samples associated with a major environmental sampling program. Capabilities and equipment for non-radiological analyses were not uniformly established between the laboratories. In addition, analytical procedures were not consistently applied for most analyses; DOE was just beginning to establish a system to manage a program of this type.

Consequently, the S&A program initially suffered through many difficulties. Those problems, in some cases, led to receipt of a relatively small portion of the data that was of an unacceptable quality; DOE has initiated efforts to recover payments made to one such laboratory. In addition, the costs incurred by DOE in undertaking this effort through DOE laboratories appears high on a per sample basis in comparison to rates available from commercial laboratories. Such comparison, however, does not consider the many ways DOE has benefitted from the S&A program.

The most obvious benefit of the S&A program is the additional strength and detail added to the findings developed through the Survey. S&A data made those findings more defensible and provided for much more reliable modeling of environmental problems through the RIS process. In addition, the data developed were made available to the facilities and served to direct subsequent efforts to further characterize the problems for eventual cleanup.

Undertaking this effort through the DOE laboratories also resulted in tangible benefits to all DOE organizations involved in the Survey. It served the purpose of preparing DOE field organizations and contractors for the major sampling and analysis efforts that are now part of the EM program. Through the Survey effort, DOE field personnel were effectively trained in field sampling techniques.

A comprehensive compendium of state-of-the-art sampling and analytical procedures was compiled and distributed, and a rigorous laboratory QA/QC program was implemented. While the lessons learned through the Survey S&A program were sometimes difficult ones, they resulted in a dramatic upgrading of the capabilities of the DOE laboratories. The laboratories have significantly increased their capacity and efficiency for analysis of environmental samples, and procedures and QA/QC programs have become much stronger as a result of the lessons learned. DOE has established a Laboratory Management Branch within the EM program to further develop, implement, and assess the effectiveness of its field sampling and analytical support. All of those benefits are critical to DOE's ability to effectively manage the major environmental investigations and cleanups that are required in the future. Few, if any, of these increases in capabilities and efficiencies within DOE laboratories would have been possible if commercial laboratories had been used.

The S&A portion of the program significantly assisted DOE field offices in identifying areas of contamination. Many facilities had neither the financial resources to begin the identification process nor the foresight or willingness to initiate such a program. S&A activities confirmed and further defined several areas of contamination that were identified during the preliminary Survey work. In many cases, S&A procedures located previously unknown contamination at inactive waste sites, some of which had the potential for offsite release. Identification of such areas allowed the development and implementation of measures to prevent offsite contamination or further spread of contamination. Many of the areas identified by the S&A activities are now being fully characterized by the sites and will be cleaned up under the EM program.

The Future of the Environmental Survey

As of this writing, virtually all efforts associated with the Environmental Survey have been completed. All field work, including S&A activities, has been completed. Preliminary reports on the findings at each site have been published, and the Preliminary Summary Report of the Defense Production Facilities has been released. Most environmental problems have been evaluated and ranked by the RIS process, and that information is being actively used by DOE programs and facilities to set priorities and direct characterization and cleanup efforts.

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Final compilation of the results from the RIS process is underway, together with the documentation that describes the DOE approach. After review by DOE program and field offices, that information will be presented as the site-specific Environmental Survey Final Reports, which will be finalized during fiscal year 1991.

Attachment 1

List of Sites Included in
DOE Environmental Survey

<u>Site</u>	<u>Location(s)</u>	<u>Preliminary Report</u>
Ames Laboratory	Ames, OH	DOE/EH/OEV-35-P
Argonne National Laboratory	Argonne, IL	DOE/EH/OEV-17-P
Brookhaven National Laboratory	Upton, NY	DOE/EH/OEV-14-P
**Feed Materials Production Center	Fernald, OH	DOE/EH/79003-T1
Fermi National Accelerator Laboratory	Batavia, IL	DOE/EH/OEV-16-P
**Hanford Site	Richland, WA	DOE/EH/OEV-05-P
Idaho National Engineering Laboratory and Component Development and Integration Facility	Idaho Falls, ID Butte, MT	DOE/EH/OEV-22-P
**Kansas City Plant	Kansas City, MO	DOE/EH/OEV-11-P
Laboratory for Energy-Related Health Research	Davis, CA	DOE/EH/OEV-28-P
Lawrence Berkeley Laboratory	Berkeley, CA	DOE/EH/OEV-23-P
**Lawrence Livermore National Laboratory	Livermore, CA	DOE/EH/OEV-09-P

**Los Alamos National Laboratory	Los Alamos, NM	DOE/EH/OEV-12-P
**Mound Plant	Miami, OH	DOE/EH-79003-T2
National Institute for Petroleum and Energy Research	Bartlesville, OK	DOE/EH/OEV-40-P
Morgantown Energy Technology Center	Morgantown, WV	DOE/EH/OEV-21-P
Naval Petroleum and Oil Shale Reserves in Colorado, Utah, and Wyoming	Casper, WY	DOE/EH/OEV-29-P
Naval Petroleum Reserves in California (NPRC)	Tupman, CA	DOE/EH/OEV-25-P
**Nevada Test Site	Mercury, NV	DOE/EH/OEV-15-P
Oak Ridge Gaseous Diffusion Plant (K-25)	Oak Ridge, TN	DOE/EH/OEV-26-P
Oak Ridge National Laboratory (X-10)	Oak Ridge, TN	DOE/EH/OEV-31-P
Paducah Gaseous Diffusion Plant	Paducah, KY	DOE/EH/OEV-20-P
**Pantex Facility	Amarillo, TX	DOE/EH/OEV-06-P
**Pinellas Plant	Largo, FL	DOE/EH/OEV-13-P
Pittsburgh Energy Technology Center	Pittsburgh, PA	DOE/EH/OEV-27-P

**Portsmouth Gaseous Diffusion Plant	Portsmouth, OH	DOE/EH/OEV-04-P
Princeton Plasma Physics Laboratory	Princeton, NJ	DOE/EH/OEV-19-P
**Rocky Flats Plant	Golden, CO	DOE/EH/OEV-03-P
**Sandia National Laboratories	Albuquerque, NM	DOE/EH/OEV-18-P
**Sandia National Laboratories	Livermore, CA	DOE/EH/OEV-08-P
Santa Susanna Field Laboratories	Ventura County, CA	DOE/EH/OEV-33-P
**Savannah River Plant	Aiken, SC	DOE/EH/OEV-10-P
Solar Energy Research Institute	Golden, CO	DOE/EH/OEV-24-P
Stanford Linear Accelerator Center	Stanford, CA	DOE/EH/OEV-38-P
Strategic Petroleum Reserve	Texas and Louisiana Gulf Coast	DOE/EH/OEV-34-P
**Y-12 Plant	Oak Ridge, TN	DOE/EH/OEV-07-P

- * Available Through DOE/OSTI and NTIS
- ** Included in Preliminary Summary Report of the Defense
Production Facilities; DOE/EH-0072

Mr. WOLPE. Thank you very much.

Mr. Chairman is back.

You had your questions that you had asked. We delayed the response on those until you returned.

I now yield to the Chairman.

Mr. SCHEUER. Dr. Frank, then we'll hear the answers.

Dr. FRANK. Thank you. I will attempt to be brief, and then if there are any further questions, we'll hopefully submit them later.

The process of setting priorities at the present time is the responsibility of my two counterpart operations units—Waste Management operations and Environmental Restoration operations—with oversight from ES&H relative to all compliance issues, et cetera.

The two systems at the present time—Environmental Restoration and Waste Management—are being developed somewhat independently but with the same goal. Thus, we have not gotten to the point to answer one of the later questions directed toward one priority list that includes both environmental restoration and waste management. Very simply, the waste management priority-setting system is based upon the categories that exist in the Five-Year Plan.

Category 1 prevents near term adverse impacts to workers, the public and the environment. Category 2 meets terms of formal legal agreements. Category 3, et cetera, which have been discussed in detail. This has actually been expanded, I believe, to seven levels of priority.

For Environmental Restoration, the priority addresses installation impact on the basis of a multi-variant system which includes—not in order of priority—regulatory compliance of which ES&H is responsible, cost socioeconomic impacts, environmental impact, and health risks. The multi-variant capability allows one to alter the impact of each one of those. In other words, to look at priority-setting on the basis of health risks by making that parameter infinity—if you will—or the regulatory compliance priority, when one makes the parameter of regulatory compliance infinity.

So one has the opportunity to look at the many impacts of priority-setting.

Mr. SCHEUER. Excuse me. I'm a little bit confused by your language. What is a multi-variant capability? The ability to do several things at one time?

D. FRANK. Yes.

Mr. SCHEUER. Why don't we use the King's English and say it. Okay?

Dr. FRANK. Yes, sir.

Mr. SCHEUER. What was that last paragraph?

Dr. FRANK. It allows one to look at the impact—the individual impact—of the parameters, if you will, on the priorities that one sets.

Mr. SCHEUER. All right. Please proceed.

Dr. FRANK. The priority-setting is a very complex issue.

Mr. SCHEUER. That's what the whole question was about. How do you set your priorities?

Dr. FRANK. We are in the process of developing those systems at the present time.

The role of ES&H is in the interpretation of regulations and in oversight of all things that we do in the Office of Technology Development. Most of our issues are in fact compliance driven.

Mr. SCHEUER. Excuse me, could you translate that into language I can understand?

Dr. FRANK. The development of technologies are compliance driven relative to occupational, environmental, regulatory, DOE orders, Federal facilities agreements with States, et cetera.

Mr. SCHEUER. Just precisely what do you mean by "compliance driven"?

Dr. FRANK. Compliance driven are agreed-to milestones with oversight or regulatory agencies.

Mr. SCHEUER. Perhaps you could give us a written statement for the record.

[Laughter.]

Dr. FRANK. I certainly will, Mr. Chairman.

Mr. SCHEUER. I think that would help.

Congressman Ritter?

Mr. RITTER. Thank you, Mr. Chairman. I admit to being new to this subject, as I am new to this Subcommittee. So, I'm going to focus my line of questioning more on process, which seems to be in contention here.

As I mentioned in my opening statement, I'm very interested in the field of Quality and bringing Quality management principles and Total Quality to the Country to the Federal Government. It seems that perhaps there is some fertile ground here.

What type of—given the massiveness of this task, the expansiveness of this task, the number of people of this task, the various task masters—what kind of Quality programs do you have, especially in light of certain parties who were testifying today said that the reorganization of ES&H must be accompanied by a change in DOE's management culture? How does Total Quality Management fit in here?

Mr. SCHEUER. And what does management culture mean?

Mr. RITTER. Is the Chairman asking me or the witness?

[Laughter.]

Dr. ZIEMER. I was hoping Mr. Chairman was asking you, but I believe that's not the case.

Were you directing your question to me, sir?

Mr. RITTER. I'm going to yield for a moment to the Chairman. He's asked to define the management culture of DOE — just the term management culture.

Mr. SCHEUER. Maybe you could make the question more precise. What does it mean to ask a person to define their management culture?

Mr. RITTER. I'm not asking; I have an idea that I know what management culture is. I may be off base, but I'm also quoting from somebody else's testimony that comes later. My own view of management culture is: the values; the modus operandi; the way people work daily; the recognition, reward, education, training for employees; the listening to employees; the participation of employees, whether there is or there isn't; what the bottom line is in terms of what managers seek in their employees. Those are some of the things that occur to me as being part of a management culture.

People will say that the U.S. management culture has failed with respect to the Japanese management culture because we've been bottom-line driven, cost-driven, accountant driven, whereas they have been process-driven to get the best possible production, the best possible product. They are customer-driven. The U.S. and the Japanese management culture is another way that term is used.

Do you want to go back to the idea of the pursuit of Total Quality at DOE, if there is such a thing?

Dr. ZIEMER. I believe your—the expression of management culture was not one of my terms, so I'm also trying to understand it—but I think in the context of the Department of Energy, in the past there has been—if you want to call it a culture or an approach to doing business whereby production took precedence over environment, safety, and health issues. I think it was that approach to management that Secretary Watkins was attempting to address.

When he spoke of changing the "culture" of the Department of Energy, he was in fact interested in changing that approach to doing business so that environment, safety, and health issues were addressed equally—or perhaps more than equally—with the issue of production. It's in that framework that I, for example, would address the issue of quality management. It would be focused, in our case, on how well we're bringing about the change through our management systems.

Let me focus it, if I might, a little bit on my own area and then I might be a little more expansive than that. But in the area of environment, safety, and health, we have a particular concern about what we call quality assurance. That has to do with what systems, what procedures, do we have in place to assure that quality is being accomplished in terms of what we do, how we do it, what materials we use.

A simple example—and I cite this because it's been in the news this week—is the issue of whether or not such a simple thing as a bolt can be relied upon to do its job of holding things together. We find—and we found in the DOE system and I think in the private sector they are finding for example that there are counterfeit bolts around that one can purchase. If you try to hold the airplane engine onto the fuselage with a counterfeit bolt, you don't have much assurance that it's going to do its job.

In our system, we would like to have management in place to assure that that doesn't occur. That means that we have to have some way of identifying the problems, and we have to have systems in place that assure us that the problems are identified and addressed. That's what we're trying to accomplish.

We are currently, in the Department, developing what we call a quality assurance order. It will be focused on how to address this kind of a problem. Part of that is very what I might call simple mechanics of how you spot counterfeit parts, if that's what your issue is. But it also has to do with how you organize, how you manage to achieve that.

So we have that DOE order under development. Our group, environment, safety, and health, has been working on such an order. That's coming up through our system and—

Mr. RITTER. Excuse me. Do you guys work at all with the Federal Quality Institute?

Dr. ZIEMER. I have heard of it. I do not know the details of it, sir.

Mr. RITTER. Again, given this major shift in requirements, a brand new program, I would urge you to look into the ideas and ideals of Total Quality.

Dr. ZIEMER. We certainly appreciate that.

Mr. RITTER. It sounds like you're touching it here and there with your Quality issues.

Dr. ZIEMER. Let me also—just a little broader in terms of the Department as a whole, and then I'm beyond where I should be commenting—but there are other groups in the Department in our management areas that are looking more precisely at what people commonly call quality management and it gets into the whole issues of how we do strategic planning to bring these ideas into the work place and so on. That is going on under the purview of some of the other groups in the Department.

Mr. RITTER. All I'm saying is that kind of thing—it sounds like this is real fertile ground for—

Dr. ZIEMER. We would be glad to provide you with additional follow-up on precisely what is going on Department-wide if you would like that information. I'm probably not in a position to answer it fully.

Mr. RITTER. For the record, I'm sure.

Dr. ZIEMER. Yes.

[The information follows:]

The DOE supports the concept of total quality management. The principal focus of DOE's attention in this area over the past two years has been to implement one of the three main principles of DOE's operating philosophy—dedication to excellence. DOE has put in place management principles and an organizational structure that improve the way managers at DOE do their jobs. These management principles and organizational structure provide for top down management with line managers at all levels being held fully accountable for all aspects of operations under their responsibility. The Department has instituted a new management "culture" that encourages managers to go beyond mere adherence to prescribed procedures and plan for unforeseen events, and to seek out and welcome constructive criticism.

Mr. RITTER. But hopefully this group of significant others that is engaged in reviewing the management practices of the Department also has some impact on your new and burgeoning and difficult situation.

Dr. ZIEMER. Thank you.

Mr. SCHEUER. Congressman Sid Morrison?

Mr. MORRISON. Thank you, Mr. Chairman.

Dr. Frank, even though I've not had the privilege of meeting you, you've become a very important person in my life with the new responsibility that you've taken on, that is for the Environmental and Molecular Science Laboratory at Hanford.

Dr. FRANK. Yes, sir.

Mr. MORRISON. We're very proud of the local effort that's gone into that and very pleased with the base of support here.

I wanted to ask a couple of questions related to that particular facility. First is on the status of the funding for the laboratory, whether it's on schedule as you would see it within the Department's planning, and also whether the Secretary's commitment to accelerate that funding for the laboratory is in place.

Dr. FRANK. Yes, sir.

As you're aware, there are numerous activities occurring relative to the laboratory. Originally, we had in our budget \$5.2 billion to continue Title II design for that laboratory. We have—and I believe will appear in the financial plan at Richland—an additional \$12 million in construction money next month that the Department—that the Admiral has directed be moved to that. Relative to the \$20 million transferred from the Department of Defense, we are presently working on that—still working on that.

Mr. MORRISON. There was some resistance on their part, as I recall the scenario.

Dr. FRANK. Our controller did not relay that to us, just relayed that we did not have the money yet, the transfer. But we have increased the funding to the MSL by \$12 million at this point.

Mr. MORRISON. I can share with you, Dr. Frank, a number of us that are very, very interested in this particular facility. If at some point in your deliberations there is a place for Congressional involvement in pursuing that accelerated funding, please let us know because we would be glad to help.

Dr. FRANK. Thank you very much.

Mr. MORRISON. I had one other question that relates somewhat to our Chairman's question, as we look at beginning to get some results on establishing priorities, if you will.

From a facility like this—and I guess I would phrase it this way—how will this Environmental Molecular Science Laboratory help the Department come up with the technologies that will be necessary to put in place, the cost-effective processes and solutions to the Department's site cleanup activities?

Dr. FRANK. There are numerous stages in the implementation process associated with new technologies. The first step is that of basic research, which can be applicable to numerous areas that cross-cut such things as conservation, environment, waste management, energy, et cetera.

From that, one has to evolve to the applied R&D area. We have not, in our organization as yet—partly because of budgetary constraints and immediate issues—addressed adequately the basic research area that will give us the long-term base for success in the applied area. The EMSL, with its associated hopeful partners in the private sector and university, as a user facility will give us—once again I'll use the word integrated—will give us an integrated approach not only where we can solve problems that we foresee in the long-term, but will also allow us to leverage the taxpayers money with private sector money to solve our problems in an effective way.

Mr. MORRISON. So, the laboratory really would be established as a basic unit that can flexibly then react to these priorities as they come along.

Dr. FRANK. Yes, sir. We envision it will have an applied component and engineering will be done at the Richland site or transferred to the specific site for remediation.

Mr. MORRISON. Thank you.

Mr. Chairman, I might—since you've had some questions—I understand a little bit because of years of battering—some of the terms Admiral Watkins—Secretary Watkins has brought the term

culture to mean something new to a lot of my constituents. And, I think when you look at it in that depth, you will appreciate what he is trying to do, to change some procedures that sort of grew up with the Department that was so oriented toward defense production that they could not see environment, safety, or health factors. So that's why, very frankly, I asked to be on this Subcommittee with you again, sir. I think you'll be very pleased with the direction the Department of Energy is taking.

Mr. SCHEUER. I think Admiral Watkins is one of the stars of this Administration. I look to him for great leadership and a great record of accomplishment. And I'm confident that he won't disappoint us. He is a superb public official.

In this new—

Mr. RITTER. Culture.

[Laughter.]

Mr. SCHEUER.—culture that Admiral Watkins is bringing to the DOE—will this new culture bring us a series of community health studies applied to the communities surrounding DOE facilities like Hanford—but others, too around the Country? If this new culture will promote that kind of community-based health study, who will do it and what will they be doing? How will they be studying and what will the end product be? Do we know enough about this new culture to give us some guidance?

Dr. ZIEMER. The answer is yes, and let me then elaborate on that.

There are already a number of community health studies underway. I would be glad to provide the full listing of those for the record.

Mr. SCHEUER. That would be helpful, but just—

Dr. ZIEMER. But then let me go beyond that. One of the initiatives that is being done—and this goes directly out of the so-called SPEERA Panel that testified last here to you — the Department is in fact funding those kinds of activities. There will be a variety of them and they will be initiated by individual communities. The direction they take will be largely dependent upon the direction the individual communities wish to take. Some of those may be studies that are in fact health studies, per se, others may be assessment studies, some may be of the dose reconstruction type of studies—a variety of evaluation type studies depending on what the community's own interests are.

Mr. SCHEUER. I would like to ask my colleague, Sid Morrison—do communities know enough? Are they sufficiently sophisticated scientifically to know what the appropriate study would be for that community? Is that a decision that's properly left to the community?

Mr. MORRISON. I'm not sure that I can give you a comprehensive answer on behalf of all facilities. I know I can speak for my area, Mr. Chairman, which really grew up as part of the Manhattan Project. It really includes some sophisticated folks. They poured the first cement—not totally sure what they were doing, but they have grown up and spent a lifetime in these areas.

The dose reconstruction has been vitally important to us because we learned a year or so ago of the release of a number of radionu-

clides into the atmosphere. People want to know, "What sort of impact this has had on my health?"

So, Mr. Chairman, in our particular community base, I can guarantee you that there is an adequate sophistication level to say, "Here's what we want to study first." I'm confident that as we move along with this new direction for the Department that there will be a number of things people will want to be reassured about because in the past they have taken many of them for granted. I think this is all a very, very positive thing. It's certainly within the jurisdiction of the oversight responsibilities of this Committee.

Dr. ZIEMER. If I might add, Mr. Chairman, I believe that many communities do also bring in their own scientific experts, or in some cases lay folks who are in the community with the appropriate background to address these issues. But clearly they would like to have sort of an independent ability to look at what is of most concern to them.

Mr. SCHEUER. And I suppose many communities have, and some might not. If the community didn't have it, then who would design the study and who would effectuate it?

Dr. ZIEMER. I believe each community would have to find appropriate persons to help them. They might call on, for example, their state board of health, or state health agencies to assist them—I believe many of them do. They might also bring in outside consultants. We would provide funds to pay for that, but we're trying to find a mode where we are not seen as simply telling them what they need to—and this might be seen somehow as manipulating what they used to do.

Mr. SCHEUER. You're telling them what we want to do.

Mr. MORRISON. Mr. Chairman, if you would yield again just for a second, perhaps I can give you an example of precisely what's being described here. Senator Hatfield has had a long time concern about Hanford. It's a few miles from the border of Oregon, but within the State of Washington.

So, for the dose reconstruction study—it was really not taking away from the Department of Energy. But between the governors of Oregon and Washington, they got funding from the Department of Energy to establish a panel of totally independent experts to design what studies they wanted to do. We found the Department in recent years to be very cooperative in this sort of activity.

So, there is a new culture, if you will, within the Department as well as being pushed out into the areas that serve the Department. I think that's very, very healthy, and it's high time that somebody really looked at it from a Congressional point of view and appreciated it.

Mr. SCHEUER. Very good.

One last question to you Dr. Frank, what is your knowledge of EPA's superfund innovative technology—the Superfund Innovative Technology Evaluation Program, or the SITE program as it is called, and what is your assessment of this program in testing and demonstrating innovative technologies for hazardous waste treatment?

What can we all learn from the SITE program that is applicable to cleanup needs of the DOE facilities?

Dr. FRANK. We do participate from my office with the EPA in many aspects, all the way from basic Research through their hazardous waste research centers, through the SITE program.

We are participating, at the present time, relative to a plasma soil treatment SITE technology in Montana, in that we are attempting to simultaneously address the potential of stabilizing Idaho National Engineering Laboratories soil, and the EPA is interested in addressing the soil relative to the plasma site.

I think it is a program which if we could move faster more economically, it would be a very applicable program to this Country. We believe that what we are attempting to do is an evolution, let's say, of the SITE program. You're not testing technologies, but testing systems delivery for full scale remediation.

Mr. SCHEUER. Well, do you have any further questions, Sid.

Mr. MORRISON. I have no further questions, Mr. Chairman.

Mr. SCHEUER. Okay.

I think this has been a very helpful hearing. This is the Committee that is supposed to be dealing with DOE, authorizing legislation and conducting oversight hearings. We have really not done that.

We haven't passed an authorizing bill for DOE in a decade. We have met the enemy and it is us. This Committee didn't do its job for a whole variety of different reasons. But since we have gone a decade without real oversight of DOE, I think there's a consensus on this Committee that it's overdue and that this new departmental culture that Admiral Watkins is bringing in, makes some thoughtful in-depth oversight areas appropriate.

I welcome your cooperation, I welcome it forthright, and your intelligent testimony. We look forward to working with you in the future.

I hope this year, Sid, that we will finally get out an authorizing bill for the first time in a decade. The oversight and the scrutiny that accompanies that process should be healthy and constructive for one and all.

Dr. FRANK. Thank you.

Mr. SCHEUER. Thank you very, very much for your fine testimony.

Dr. ZIEMER. Thank you, Mr. Chairman.

Mr. SCHEUER. We will now have Panel II.

Dr. Peter Johnson has been a senior associated at the Office of Technology Assessment for over a decade and a half. He was the project director for the informative report recently released by OTA, "Complex Cleanup: The Environmental Legacy of Nuclear Weapons Production." Dr. Johnson is an engineer by training and has expertise in a wide variety of environmental issues.

He is accompanied at the witness table by Dr. Amelia Govan, Dr. Joan Harn, and Dr. Tara O'Toole, all of whom are seeing your analysts at OTA and who helped to provide the OTA report. We're delighted to have you all.

Dr. Johnson, why don't you take 5 or 6 minutes and give us your view?

STATEMENT OF DR. PETER JOHNSON, OFFICE OF TECHNOLOGY ASSESSMENT, WASHINGTON, D.C.; ACCOMPANIED BY: DR. TARA O'TOOLE, SENIOR ANALYST, OFFICE OF TECHNOLOGY ASSESSMENT, WASHINGTON, D.C.; AND DR. JOAN HARN, SENIOR ANALYST, OFFICE OF TECHNOLOGY ASSESSMENT, WASHINGTON, D.C.

Dr. JOHNSON. Thank you, Mr. Chairman. I will just summarize the statement I have submitted for the record.

We are very pleased to be here today to give you some conclusions from our recently completed study, which is entitled, "Complex Cleanup: The Environmental Legacy of Nuclear Weapons Production". We have made that report available to the members of this Subcommittee.

That study concerned the waste and contamination problems at the nuclear weapons complex. It was released earlier this month. There was a request by the Senate Committee on Armed Services.

The Study focuses on the DOE weapons complex, which, as you know, is a network of facilities across the Nation. They include the plants, reactors, weapons assembly plants, and so forth.

This vast industrial empire employs a total of more than 100,000 people. Some of these sites are near communities. That's one of the reasons that we looked at community health.

From our study we have concluded that there is high-level waste, transuranic waste, and other radioactive materials, as well as chemically hazardous waste that is stored around these sites. There are old buried waste sites and there is extensive contamination of sediments, groundwater and surface water.

As you've heard earlier, the Department of Energy recognizes the seriousness of these problems and is committed to complying with all relevant environmental regulations. It's begun to apply large resources to the remediation task and contamination problems.

One of the conclusions from the OTA study was that the prospects are poor for effective and acceptable cleanup of the weapons complex over the next several decades, even if the responsible agencies diligently pursue their current waste management and environmental restoration programs. We have concluded that unless some key capability and credibility problems are addressed and rectified, much money could be wasted with failed cleanup efforts.

We'd like to focus on two of our findings today. The first concerns the very difficult task of conducting rigorous, sound, and comprehensive assessments of public health impacts from the waste and contamination at the weapons plants.

The other subject is the need for a health risk focus for a new technology development program.

On the subject of the off-site public health question, we concluded that a more aggressive and coordinated investigatory process, conducted by qualified and independent parties with early and continuous public involvement that can assess public health issues and trace public concerns about health impacts to their possible sources—would be necessary to identify the problems requiring immediate attention and to demonstrate more convincingly that public health is being protected.

I might mention that the discussions you had a little earlier regarding the dose reconstruction projects at Hanford and also at Fernald, Ohio only focused on one very small aspect of this question, releases that have occurred in the past, some many years ago. The question we're interested in here, under the subject of off-site public health—is one of understanding health risks from the current contamination problems and what they may— what kind of risks they may pose for the surrounding communities.

We've concluded that the public health assessments would only be credible and effective if they are conducted by an agency that is both skilled in health evaluations and independent of the Department of Energy.

There's also a lot of work that DOE itself must accomplish in order to provide accurate and high quality data. It appears to us that much of this effort could fall with the responsibility of the ES&H branch of DOE, whom you have just heard from earlier.

For example, ES&H could play a crucial role in developing procedures that would facilitate speedy communication of technical information about environmental conditions to those interested. The coordination of such information between DOE itself and Federal agencies will be necessary if credible studies of possible off-site health impacts are to be accomplished.

In addition, another example would be that the ES&H branch of DOE would need to plan for adequate health and safety protection for large numbers of cleanup workers, who are going to be involved in this very massive cleanup effort. That study is coming before us.

These workers will face work hazards and health risks that differ from those encountered in production facilities. ES&H will need to increase staff with appropriate experience and background beyond what they have today in order to do this work.

The second finding I would like to emphasize is the need for greater focus for technology development efforts. The Environmental Restoration Program, as you have heard, is in the very early stages and very little actual cleanup work has been done. Technologies that could effectively remediate certain sites are not available today, nor can they be applied within reasonable resources.

OTA's work shows that the past efforts to develop new cleanup technologies have yielded only marginal results. Very few systems now available for removing contaminants from soils and groundwater have reached the application stage even after many years of substantial and consistent development efforts. It is therefore important for the current technology efforts within the Department to focus on the greatest needs and the areas in which new technology could offer significant benefits.

The first step here would be to identify the most urgent and serious needs based on potential health risks. Earlier, you heard about the priority systems that are under development by two different Department of Energy offices—the waste management and the environmental restoration office. I might note that neither of these offices incorporate public health expertise in the work that they do to set priorities for cleanup.

Finally, I might say that the Department of Energy has begun to organize and plan its technology development effort in a structured way and there are some promising new technical approaches to

soils and groundwater remediation that could offer benefits if they prove successful. However, the Department has not yet made the critical link between priority needs based on health risks and potential technical solutions to those needs. This is the linkage that will assure a focus on urgent problems and prevent a waste of resources on areas of minimal risk.

Thank you, and we will be very happy to answer any questions you may have.

[The prepared statement of Dr. Johnson follows:]

Testimony of

Peter A. Johnson
Tara O'Toole
Joan Harn

Oceans and Environment Program
Office of Technology Assessment

Before the
Subcommittee on Environment
of the
House Committee on Science, Space, and Technology

on

Cleanup of the DOE Nuclear Weapons Complex

March 7, 1991

Mr. Chairman:

Thank you for the opportunity to present to this Subcommittee some conclusions from OTA's recently completed study: *Complex Cleanup: The Environmental Legacy of Nuclear Weapons Production*. My name is Peter Johnson and I was the project director for that study. With me today is Dr. Tara O'Toole, a physician and an OTA Senior Analyst who was responsible for our investigations of public health impacts from the waste at the Department of Energy's Nuclear Weapons Complex. Also with me is Joan Ham, an OTA Senior Analyst who was responsible for groundwater cleanup aspects of our study.

Our study of waste and contamination problems at the Nuclear Weapons Complex was released on February 11, 1991, after about an 18-month effort by OTA staff and its advisers. It was requested by the Senate Committee on Armed Services. The report has been provided to members of this Subcommittee.

The study focused on the DOE Nuclear Weapons Complex--a network of facilities spread across the Nation that contain nuclear reactors, nuclear materials processing plants, weapons components manufacturing plants and final weapons assembly. Some were built 45 years ago, others 25 years ago. It is a vast industrial enterprise with some sites covering hundreds of square miles, employing a total of more than 100,000 people. Some sites are in remote areas and others relatively close to large populations.

Our report contains data from the 14 major sites in the Weapons Complex in 12 States, plus one underground waste repository. There are many other smaller sites within the Department of Energy that are not in this group but do have similar problems.

At present, there are large quantities of high-level and transuranic radioactive wastes, as well as mixed radioactive and chemically hazardous waste, stored within the Nuclear Weapons Complex. In addition, millions of cubic meters of radioactive and hazardous wastes have been buried throughout the Complex, but there are few adequate records of burial site locations and contents. Contamination of soil, sediments, surface water, and groundwater through the Complex is serious and widespread.

DOE recognizes the seriousness and extent of the problems at the Weapons Complex; it is committed to complying with all relevant environmental regulations, and it has begun to apply enormous resources to remediate past contamination and improve waste management practices for the future. Unfortunately, there are at present major problems hindering the progress of DOE and other Federal and State agencies involved in the cleanup. There are great technical difficulties inherent in detecting and mapping the contamination at specific sites, the technologies for effective cleanup are not readily available, and there are major uncertainties regarding the effectiveness of cleanup technologies to be developed. There is a lack of qualified personnel at all the Federal and State agencies involved in the cleanup. There are major inadequacies in the health effects assessment effort. And there is the problem of the continuing inability of DOE to develop a decision making process that is credible and acceptable to the public. Clearly, these are not problems that can be solved quickly, easily or inexpensively.

In the course of its assessment, OTA found that the waste and contamination problems throughout DOE's Nuclear Weapons Complex will continue to bring unprecedented challenges in the future. Much time and effort will be required to define

and address technology deficiencies. Until public health and environmental effects of the waste and contamination are adequately assessed, surrounding communities are expected to continue expressing strong concerns about potential adverse impacts. There is currently no consensus on cleanup goals, but it is generally agreed that little has really begun, and that cleanup efforts will require tens of billions of dollars or more over the next several decades.

The OTA study concluded that prospects are poor for effective and acceptable cleanup of the Weapons Complex in the next several decades even if the responsible agencies diligently pursue their current waste management and environmental restoration programs, activities, and plans. Unless some key capability and credibility problems are addressed and rectified, much money could be wasted in failed cleanup efforts.

One key finding that we would like to emphasize today concerns the very difficult task of conducting rigorous, sound and comprehensive assessments of public health impacts from the waste and contamination at the Weapons Plants. Another is the need for a health risk focus for new technology development programs.

DOE has asserted that no current contamination scenarios pose "imminent threats" to the public health. At present, however, there is little or no reliable information about off-site contamination or the potential for off-site human exposure to contaminants. In addition, the possibility of chronic public health impacts resulting from weapons site pollution has not been adequately addressed by DOE or any other agency. While DOE's assertion that the contamination poses no imminent health risks may be correct, OTA found that this assertion is not substantiated by scientific evidence, and has understandably been met with widespread skepticism.

OTA has concluded that a more aggressive and coordinated investigatory process--conducted by qualified and independent parties, with early and continuous public involvement--that can assess public health issues and trace public concerns about health impacts to their possible sources is necessary to identify problems requiring immediate attention and to demonstrate more convincingly that public health is being protected.

Even though DOE has sponsored a few health studies at selected sites and begun to plan for support to health assessment projects, the progress is minimal. What is needed is an aggressive, scientifically sophisticated, site-specific, and open evaluation of possible off-site health effects by an environmental health institution outside of the Department of Energy. There is a need to enhance the structure and process for assessing potential public health impacts from Weapons Complex waste and contamination. It is urgent to begin evaluating the possibility of off-site health effects, developing health-based priorities, and addressing community health concerns. Unless and until the contamination-related health issues of most concern to the public are recognized and addressed, the most ambitious, sophisticated, and well-meaning cleanup program could meet with suspicion and legal challenges.

DOE currently lacks personnel and capability to carry out "community health studies", including investigations of possible off-site health impacts of the environmental contamination at DOE facilities. It is highly unlikely that DOE can attract enough qualified personnel in the field of environmental health to carry out such studies. OTA found that the public's mistrust of DOE makes it unlikely that any health effects studies designed or conducted by DOE will be accepted.

While we have concluded that public health assessments will only be credible and effective if conducted by an agency both skilled and independent of DOE, there is also considerable work that DOE itself must accomplish in order to provide accurate, high-quality, comprehensive data in readily available form to the health assessment teams and interested citizens. Much of this effort could fall within the responsibility of the Environmental Safety and Health (ES&H) Branch of DOE.

This is no simple task and to assure success the Department of Energy will need to follow through with many of its own programs that are weak now in terms of attention and resources, both funding and personnel.

ES&H could play a crucial role in developing procedures that would facilitate the speedy communication of technical information about environmental conditions to interested parties. An enormous amount of information will need to be shared among scientists if scientifically sound health assessments are to be accomplished and if health-based cleanup needs are to be recognized. The prompt communication and coordination of such information within DOE itself and among federal agencies will be absolutely essential if credible studies of possible off-site health impacts of the contamination are to be accomplished. ES&H could play a vital role in coordinating such information sharing.

Unless and until DOE improves its capacity to share information about environmental matters with the public - and this will mean allowing public comment as the assessment process plays out, not just providing a "comment period" at the end of a lengthy deliberation process - DOE's culture of secrecy and insularity will be seen by many as a continuing reality.

Even now, many months after Secretary Watkins affirmed DOE's commitment to a new culture of openness, it is extremely difficult for citizens, technical experts or, indeed, OTA to obtain updated information about cleanup activities. For example, the DOE sites do not publish lists of recent cleanup actions or compliance agreements submitted to EPA or other regulatory agencies. Thus, when a DOE site forwards a "draft" compliance document to EPA, EPA staff reviews the document, a process requiring weeks or months given the personnel limitations at EPA, the draft is returned to DOE with comments, reworked and resubmitted by DOE to EPA. Only when the final document is ready, often many months later, is the proposed action, now virtually a "done deal" as far as DOE is concerned, made available for a 30 day public review.

Another example of the difficulty outside groups have in obtaining information is the long lag in releasing annual DOE site-specific Environmental Reports. These reports differ in content, comprehensiveness and quality, but afford some picture of important environmental issues and findings at a particular site. However, as of late 1990, only one of the 1988 reports was available to OTA.

In general, OTA found that "outside groups", including the Rocky Flats Advisory Council appointed by the Governor of Colorado, and the National Academy of Science panels convened to advise DOE on issues at INEL and Hanford, as well as independent citizens and environmental groups continue to face great challenges in getting information about environmental contamination and cleanup activities out of DOE. Requests for information must be very specific and persistent in order to be successful, and many groups have had to resort to Freedom of Information Act requests to obtain

documents that should be part of the public domain. This situation fosters the perception that DOE has something to hide and contributes to DOE's public credibility problems.

ES&H will need to plan provision of adequate health and safety training and protection for large numbers of cleanup workers. These workers will face work hazards and health risks that differ from those encountered in production facilities. An OTA background paper addressing health risks to cleanup workers at the DOE sites will be released later this year. If ES&H is to develop sound plans and issue adequate health and safety policy guidance for cleanup workers in the field, it will need increased staff with appropriate experience and background. More continuous and effective communication between ES&H headquarters staff and field facilities is also essential.

In all of these cases the DOE has made commitments to enhance and support programs in ES&H. However, our investigations note that progress has been extremely slow—it would be useful for this Committee to encourage DOE efforts to make Complex cleanup goals more of a reality than a *hope*.

A second finding that we would like to emphasize today is the need for a greater focus for technology development efforts. The environmental restoration program underway at the Weapons Complex is in the very early stages, and little actual cleanup work has been done. At a few sites, some simple containment and stabilization activities have been performed by "capping", or by removing contaminated soil and storing it elsewhere in a more controlled form. Technologies that could effectively remediate certain sites either are not available or cannot be applied with the resources now contemplated. It may be impossible with current technology to remove contaminants

from certain groundwater plumes and deeply buried soil or, even if possible, it may be extremely expensive or require prolonged periods of operation. The most promising new technologies will require many years of research, development, and testing at specific sites.

OTA's analysis shows that past efforts to develop new cleanup technologies have yielded only modest results. The few new systems now available for removing contaminants from soils and groundwater (such as vapor vacuum extraction) or for stabilizing contamination (such as in-situ vitrification) have reached the application stage only after many years of substantial and consistent development efforts.

It is therefore important for the current technology development effort within DOE to focus on the greatest needs and the areas in which new technology could offer significant benefits. The first step is to identify the most urgent and serious cleanup needs based upon potential health risks.

After determining those problems most in need of solution, DOE could identify the technologies that are most likely to address key needs and investigate the alternatives that can be developed for each, together with relative costs and benefits of these alternatives. This identification of needs, followed by an analysis of alternative technological approaches, should be a continuous process that feeds in new characterization data as well as information on health and environmental effects as they become available.

If DOE is going to develop advanced technical solutions, however, it will have to be realistic about the effort, time, and funds required. Many projects could require at least the level of effort devoted to in-situ vitrification over the past 10 years. Considerable

effort must be given to the demonstration, testing, and evaluation phases of technology development. If a new technology does not perform as expected under particular field-test conditions, the results should not necessarily be viewed as a failure. Rather, early problems can provide opportunities to improve a technology and develop appropriate applications.

In some instances, however, not enough is known to solve a problem -- e.g., groundwater remediation. The best approach in this case may be not to spend a great deal of money attempting to develop new approaches, but rather to contain and monitor contamination, to apply state-of-the-art technology at each place groundwater contamination is found, and to learn about the successes, failures, and appropriate applications of this technology. In some cases, it may not be feasible to clean up an aquifer but instead to rely on point-of-use treatment.

Although investing in technology is never a sure thing, a program that is too diverse and scattered among research projects may not be an effective way to solve the problems existing at weapons plants. What is needed is a process that will devote adequate sums of money and concentrated efforts to focused technological development, rather than spending a little money for many items on a long "wish list."

DOE has begun to organize and plan its technology development effort in a structured way and there are some promising new approaches to soils and groundwater remediation that could offer significant benefits if they prove successful. However, DOE has not yet made the critical link between priority needs based on health risks and potential technical solutions to those needs. This is the linkage that will assure a focus on urgent problems and prevent a waste of resources on areas of minimal risk.

Mr. SCHEUER. I'm really concerned and astonished to hear that they don't have health personnel involved in these studies for environmental restoration and waste management. How can that be?

Dr. JOHNSON. The current work that's underway is mainly planned and executed by the operations offices within the Department. Their approach to it is to try and develop the work in a way that meets the regulatory process. But in doing that, it takes a long time before they get the data that's necessary in order to do health evaluations. It's a very long process and right now it begins with—instead of with a look at the health problems, it begins with engineering solutions. It's a little bit backwards in a way.

I might ask whether Dr. Tara O'Toole could elaborate a little bit on that.

Mr. SCHEUER. Please do.

Dr. O'TOOLE. OTA was very surprised at the absence of health personnel in the cleanup work as well.

Mr. SCHEUER. I can't believe it.

Dr. O'TOOLE. Well, it's surprising, Mr. Chairman. Let me elaborate on it a little bit.

It is a very difficult task to figure out what the off-site health effects of the current contamination at the DOE weapons sites might be.

Mr. SCHEUER. But my dear lady, Doctor O'Toole, if you don't study the potential health effects, how will you ever know what they are?

Dr. O'TOOLE. You might find out if, for instance, the citizens, obtained by a Freedom of Information Act—as happened in Hanford, about 19,000 pages worth of DOE data that showed that extensive releases had occurred in the past, and then asked CDC and their governors to get involved in initiating studies, such as the Hanford Environmental Dose Response Project, which is a model of good science, I would add.

In addition, the number of communities which are concerned, based upon what little they do know in Colorado and Tennessee and in Idaho, have through their governors and their State representatives asked DOE to include as part of their interagency agreements monies for State-sponsored health studies. DOE itself, however, is not involved in any community-based studies, although there is an item for that subject on the ES&H budget.

Mr. SCHEUER. Apparently, from their testimony, they're willing to fund them.

Dr. O'TOOLE. That's terrific.

Mr. SCHEUER. Who would be responsible for the designs of such a study, which didn't include health effects. That boggles my mind.

I'm going to yield to Congressman Sid Morrison, who is probably more familiar with this matter than I am.

Mr. MORRISON. Mr. Chairman, if your mind is boggled at this early stage of this investigation, we have quite a ways to go. Unfortunately, there is a legacy here that came with the military project known as the Manhattan Project. It was militarily driven, and it's been sort of a closed loop. Of course, we're arriving now with this Subcommittee.

I might add, with Admiral Watkins—a new look at the Department of Energy at a very interesting time—as a representative of

one of the areas involved, I have to admit that now there is a lot of looking back to do, and saying, "what really have we wrought as we have gone through this process?"

I appreciate the Chairman giving me a chance to sort of move on ahead on this. There are a lot of questions that I am fairly comfortable with, at least the progress that's being made. But let me ask a couple of things.

Dr. Johnson, you mentioned the need for a focus on health risks in remediation activities. Some of us have a great interest in risk assessment. What role may scientific risk assessment play in this process of determining what's important as far as health risks are concerned?

Dr. JOHNSON. Risk assessment is a term that used to mean a lot of different things, some of which have to do with engineering design of equipment and facilities and some of which have to do with looking at data and trying to determine the probability of health threats based on what contamination data is available. But all of this plays a part. I guess in our study we have discussed the question of risk assessment quite extensively as it applies to doing standard risk assessments under the superfund law that's required.

One of problems with that, though, is that the standard risk assessments that are required under the cleanup process take place a long ways into the future. They don't take place until a lot of data are collected and a lot of information is available. Sometimes that's—as a matter of fact, the Department of Energy has hardly done any risk assessments on any of their sites yet. I think one of the few that is completed is at Lawrence Livermore National Lab.

But in any case, I think that the question that we have focused on is that investigating public health impacts. The possibility of health impacts also needs to be considered very early in the process. It needs to be somewhat of a cornerstone to determine what the worst problems are.

You heard earlier about the environmental studies, and they were conducted with the understanding that perhaps some determination could be made of the worst problems, but that hasn't been done yet. We're concerned about taking that first step and understanding a little bit more about the public health impact before work goes forward.

Would you like to add to that?

Dr. O'TOOLE. The risk assessment process within Superfund has become increasingly sophisticated over the years. However, if you look at the 1988 record of decisions, it was between 3 and 4 years from the beginning of an assessment at a superfund site until the risk assessment was completed. Most of these sites were far less complex, far less extensive than the DOE sites, but it took 3 to 4 years before you got to the risk assessment.

During that time, of course you're collecting data and analyzing it in an attempt to get to some numerical understanding of the health risk, usually concerning a cancer risk associated with a particular site.

However, given the thousands of areas of contamination throughout the weapons complex, we think there is a crucial need for a more immediate handle on what areas of contamination are in need of attention now, and not 7 years from now. We think the

best way to do that—and this is not something that OTA dreamed up, this is a fairly straightforward environmental health methodology—is to first concentrate on determining whether or not there is a potential for off-site exposure to the existing contaminants. OTA believes exposure assessments will yield a reasonably small and manageable list of areas that might pose an off-site exposure potential. You could study them and perhaps go forward in a more urgent way with your risk assessment of those particular sites.

But if we just dawdle along doing one risk assessment after another, it's going to be 12 years before we have any numbers on whether there are health risks. Because of the enormous uncertainties involved in health risk assessments—which require you to make a lot more assumptions than are needed when you're trying to figure out if for example the challenger will fly or not—we're going to have a lot of controversy and a lot of contention about the accuracy and the reliability of those risk assessments even when they are available.

Mr. MORRISON. Should the Department of Energy be doing these?

Dr. O'TOOLE. No, we do not think that the Department of Energy has either the scientific capability in environmental health to do environmental health assessments or risk assessments, and we definitely don't think they have the credibility among outside communities to do that job. As John Till, the Chairman of the Hanford DOSE reconstruction panel said, "Even the best science won't get us anywhere if people won't believe it." So the credibility of the people making the decisions about risk is extremely important. We don't think it's worth building a whole apparatus within DOE to do that. We would prefer to see it done by an outside Federal agency within HHS, or EPA, or some other agency.

Mr. MORRISON. Have you envisioned that to any finer detail than that as far as how it should be structured? You've indicated within HHS.

Dr. O'TOOLE. We suggested a number of options. We did not examine the bureaucracies within HHS in great detail, so we didn't feel as though we couldn't tell the Congress how they ought organize this, but the obvious candidates are either the Agency for Toxic Substances and Disease Registry, within HHS, which has the unfortunate acronym of ATSDR, which is charged under Superfund with doing health assessments at all Superfund sites, or some new agency within EPA, or some new combination of ATSDR and some sub-unit of CDC. Any one of those would be possible candidates.

The most logical would be ATSDR since they have the statutory charge to do this kind of health assessment anyway, and they have the proper range of professionals to do this sort of work, but they're a very small agency. They have 200 people all told. And they're very new. They're going to need a lot more resources and a lot more expertise to take on the weapons sites.

I would add that DOE is beginning to develop agreements with ATSDR to do the Superfund mandated health assessments at the weapons sites. ATSDR sent DOE a letter in 1986 requesting agreements with DOE to get these studies underway. Finally, an MOU was signed in the fall of 1990—ATSDR must now go out to each of

the operations offices within DOE and negotiate separate MOUs to go ahead and actually get something going on the ground.

Mr. SCHEUER. And an MOU is a Memorandum of Understanding.

Dr. O'TOOLE. I'm sorry, Mr. Chairman. That's quite right.

Mr. MORRISON. What is happening, then, is within DOE they are going to recommend an agency as having oversight. But, I sense that you would eliminate some of the intermediate steps. Would you give this agency direct authority? Or would you continue to—in other words—should we as a Subcommittee, as we look at this whole issue area, say, "ES&H needs more support in this area so that they can do more of this outside contracting?" Is that your line?

Dr. O'TOOLE. I don't think there's any question that ATSDR, if that is the agency that is entrusted to do the health assessments.

Now ATSDR does health assessments, by law, but it is not going to be enough at the weapons site, in OTA's view. If ATSDR is told by this Committee or whomever that "thou shalt do more" in order to do accurate, comprehensive health assessments throughout the complex, then I think it makes sense that funding should come from DOE. But there would have to be very careful plans made so that it didn't appear to the public that the studies were "tainted"—in the Governor of Colorado's phrase—by DOE's involvement.

And there is an enormous need for ES&H to get involved in terms of supplying the available environmental data as it comes to hand. Many federal and state agencies and parties are going to need this data to make health assessments. That is not going to be a small job. At the moment, ES&H is not involved in the cleanup in any appreciable way. And that is a problem.

Mr. MORRISON. Mr. Chairman, I thank you for this time. I can see a path which might well spin from this. And that is a recommendation that the legislative authority of the actual investigative group be expanded and that we would recommend ES&H utilize this independent counsel.

Mr. SCHEUER. We'll consider all those.

Mr. MORRISON. I thank you, Mr. Chairman.

Mr. SCHEUER. Congressman Mike Kopetski?

Mr. KOPETSKI. Thank you, Mr. Chairman.

I have a conflict of interest in part which I think I should announce. I'm what's known as a down-winder, one of those people that because I was born and raised over in Pendleton, at some point in my life, because of Government policy and error of scientists, they decided to release some of that stuff into the atmosphere. I got a dose of it along with my family and along with everybody I grew up with. So I have a jaded view about DOE and their credibility, quite frankly, in this whole area.

Whether they're trying as hard as they can doing all they can, it's very difficult—as O'Toole was suggesting—because of the past.

So I wanted that to be out there for everybody to know.

I was struck by my colleague's questioning from Washington—I guess as a summary, Mr. Chairman, I was wondering if it is appropriate, or if OTA already has a memorandum as to what is sufficient for ATSDR to be doing, and sort of what jurisdiction or activity is not appropriate, and should be covered by some other agency.

If that doesn't exist, then somehow or another this Subcommittee might obtain it.

Dr. JOHNSON. We have made copies of our report available to the members of the Subcommittee, and within that report there is a discussion of what appears to be the best or more logical approaches to this which would include the kinds of work that needs to be done. We really haven't gone into it in any great detail, but there is information there that discusses both the problems with the current agencies that have some capability and expertise—and as Doctor O'Toole said, the ATSDR is one that seems to have the most capability under present conditions. But even they have shortcomings.

So we have discussed in our report the kinds of things that would be necessary in order to develop their capability further. We haven't gone into great detail to make any estimates of either total cost or total amount of effort that may be required for this whole program. There is a lot to be done. It's not a simple task.

Mr. KOPETSKI. Can we ask for more detail? Would that be appropriate?

Dr. JOHNSON. Yes, we can supply some more detail on that.

[The material referred follows:]

Office of Technology Assessment

Supplemental Information
in Reply to Questions from
The Subcommittee on Environment
House Committee on Science and Technology
at Hearings on March 7, 1991

April 2, 1991

The Subcommittee asked OTA to provide additional information about the process to address off-site public health threats from the contamination at the DOE Weapons Complex and the appropriate agency jurisdiction for this work.

The OTA report, Complex Cleanup, discusses these questions and the following two excerpts from that report provides a reply.

Excerpt A, from Chapter 3 of the OTA report, addresses in general terms the nature of the work needed for developing health-based cleanup objectives. Excerpt B, from Chapter 4, discusses the option that was developed from our analysis to enhance the structure and process for assessing potential public health impacts. As discussed, the implementation of this option could involve strengthening the capabilities and authority of an existing agency (such as ATSDR) or establishing a new public health assessment office.

As noted in the report, there will be many uncertainties in any evaluation of possible adverse health impacts of the Weapons Complex pollution. The collection and interpretation of data describing the nature and extent of the environmental contamination is a long and difficult process. Serious limitations in the scientific understanding of the potential biological effects of exposure to environmental contaminants will also be a

factor. It is therefore crucial that the scientific methods employed to assess possible off-site health effects be of high quality, and that the process of designing and conducting such assessments be open and credible.

- Excerpt A -

Developing Health-Based Cleanup Objectives

Because the scope and the complexity of Weapons Complex pollution make immediate cleanup of all contamination impossible, there is a need to identify and address in a timely manner those sources or areas of existing contamination that pose the most significant and urgent health hazards. There is also a need to determine what cleanup levels will protect public health. The latter task may require additional research into the biological effects of toxic exposures unique to the weapons sites.

At the same time, however, the cleanup must encompass the major health issues raised by past environmental contamination and address questions that extend beyond the identification and remediation of current contamination. Failure to frame relevant health issues broadly enough may jeopardize public support for the cleanup effort as a whole.

In addition, remediation activities should include disciplined consideration of potential risks to workers and surrounding communities. Finally, methods to gauge the progress of remediation efforts should be developed.

Based on these needs, OTA has identified five basic health-related objectives that must be realized if the cleanup is to be successful. These health-related objectives are interrelated and interdependent. It is unlikely that any single objective will be realized unless significant progress is made in all five. Five health-related cleanup objectives is discussed in the material that follows:

1. addressing current and future exposure threats,
2. identifying environmental characterization and research needs,
3. satisfying community health concerns,
4. minimizing risks to cleanup workers and nearby residents, and
5. developing methods to establish remediation levels adequate to protect public health.

1. Addressing Current and Future Exposure Threats

Situations that pose a current threat of off-site exposure to toxic materials should be addressed immediately and efforts undertaken to contain all such contaminants and, where feasible, to eliminate exposure. Situations that represent a potential for future exposure should be addressed next, and so forth, until all toxic contaminants are either eliminated, securely contained and monitored, or reduced to levels consistent with the protection of public health.

To identify the most serious contamination scenarios or to craft interim strategies to prevent current problems from getting worse, it will be necessary to assemble a reasonably complete qualitative picture of pollution

at the Weapons Complex and to obtain at least preliminary data on human exposure and dose levels. Exposure estimates are key factors in evaluating the potential for, or past occurrence of, specific health impacts stemming from contamination at particular weapons sites. Obviously, health impacts cannot occur if people have no contact with toxic contaminants.

A picture of which contamination scenarios present the most significant or imminent threat of human exposure is likely to narrow the issues of urgent concern to a manageable number. Currently, there is no way of knowing which of the hundreds of areas of environmental contamination at the Weapons Complex are most pressing, or most in need of further study or interim containment action, because no complexwide strategy exists for relating environmental sampling data to possible health effects.

Until recently, only rudimentary methodologies were available for assessing individual exposure to environmental contaminants. More refined, multidisciplinary approaches to exposure assessment are now feasible and include sophisticated computer models that incorporate detailed environmental transport pathways, multiple human exposure routes, and demographic data of who is exposed to what. Efforts to validate such models with environmental sampling and biological monitoring have rendered them more reliable. In some cases, where contaminants can be detected in blood, urine, or exhaled breath, measurements of individual exposure can be obtained. These more accurate exposure models are not in wide use, however, and most biological markers of exposure remain research tools that are available for only a limited number of contaminants.

Exposure assessments will be included as components of the quantitative risk assessments required at all Superfund sites. Health assessments performed by ATSDR and also required by CERCLA will include assessments of how many people are potentially exposed to what toxic materials. However, these steps in the Superfund process usually do not occur until long (3 to 5 years) after environmental characterization is begun. Thus, many contamination scenarios within the Weapons Complex will not be subject to exposure assessments for years to come.

Whether weapons sites that are not Superfund sites will undergo formal exposure assessments is unclear. In addition, there is no assurance that the exposure assessments ultimately done will be of high quality. EPA, charged with the responsibility of reviewing all Superfund risk assessments, has not yet been granted the resources necessary to conduct credible oversight functions at the weapons sites.

Exposure assessments are difficult to execute and are not infallible. They will not provide a quantitative comparison of the relative risks of contamination scenarios across all weapons sites. However, as discussed, CERCLA risk estimates are not likely to establish a meaningful ranking of health risks either. Understanding where human contact with existing contamination is occurring, or is most probable, is the first step necessary to determine whether and where off-site health impacts are of concern. Robust exposure estimates are likely to be more attainable and less controversial than QRAs, and could provide, in a relatively short time, "first-cut" assessments of those areas of contamination that require immediate attention or further study. Refinements of initial exposure assessments could be carried out as additional environmental data become available.

2. Identifying Environmental Characterization and Research Needs

Situations requiring more in-depth characterization or further research should be identified early so that the requisite information is available when needed for remediation efforts.

The process of obtaining a detailed and accurate picture of the migration routes, concentrations, and chemical forms of environmental contaminants is time consuming, technically demanding, and costly. It is important, therefore, that environmental characterization efforts be well planned and clearly linked to defined information needs. Preliminary qualitative exposure assessments and initial environmental monitoring data could be used to design strategies for additional environmental data collection and health studies, and they could also highlight issues suitable for further field or laboratory research.

The information needed to conduct health studies is often different from the data required to conduct a CERCLA risk assessment. Failure to think carefully about appropriate health issues or the methodology and design of proposed health studies and to plan for the acquisition of health-specific data may delay completion of the health assessment process.

Scientists working in multidisciplinary teams would be more likely to recognize the potential health implications of early environmental monitoring results and to anticipate the additional information needed to assess possible health impacts or design remediation actions. Such a multidisciplinary

approach could sharpen the focus of environmental sampling efforts and might help to contain costs or, at least, to establish whether proposed investments of time and money serve a useful purpose.

3. Satisfying Community Health Concerns

When the cleanup is complete, communities should be satisfied that good-faith efforts to achieve comprehensive analyses and effective mitigation of all significant past and present off-site health impacts have been carried out.

It is essential that the public see decisions about health impacts, cleanup strategies, and remediation goals as fair and credible. No matter how much money or effort is expended on the cleanup, many areas of great uncertainty and many controversial issues will remain. For example, situations may exist in which the best scientific analyses indicate that the safest course is to leave contaminants undisturbed, at least until improved remediation technologies are available. Some communities are likely to contest and resist such findings, however, unless the decisionmakers are perceived as unbiased and mindful of potential health and environmental impacts.

Forums for eliciting community views and ideas will be needed. The concerns that preoccupy communities neighboring weapons sites have not been addressed effectively and are unlikely to be resolved solely by compliance

with environmental regulations. It is ATSDR policy to consult with local communities as part of every health assessment done at Superfund sites. However, ATSDR is unlikely to have the resources necessary to implement this policy fully. Serious and sustained efforts will be required to educate community members about technical aspects of the contamination, proposed remediation plans, and associated problems or scientific uncertainties. Similarly, DOE managers and technical experts must solicit, acknowledge, and respond to the health concerns of local communities.

Unless measures are taken to recognize and respond to the health concerns of community members, disputes over the details of regulatory compliance will become the focus of attention and the courts will be the arena of negotiation. Repeated challenges to the adequacy of proposed remediation strategies, along with demands for examination of and compensation for the consequences of releases from the Weapons Complex, are likely to occur. Such challenges could significantly delay the cleanup and increase costs.

4. Minimizing Risks to Cleanup Workers and Nearby Residents

Characterization and remediation activities should be conducted so as to avoid subjecting cleanup workers or off-site residents to greater health risks than those posed by the pollution itself.

The collection and analysis of some weapons site contaminants, such as the highly radioactive waste stored in tanks at Savannah River and Hanford, may impose significant risks on cleanup workers. Disturbing some buried waste or contaminated sediment may prove more dangerous to humans and more disruptive of local ecosystems than leaving the contamination in place.

Risk Assessment Guidance for Superfund does not stipulate that the risks to cleanup workers or the public as a consequence of environmental sampling or remedial actions be addressed explicitly. The need to consider possible adverse impacts of cleanup activities is obvious, however, and it would be useful to analyze these issues in a disciplined and organized way. DOE and EPA have stated that they intend to consider these factors, but no rigorous approach has yet been formulated.

5. Developing Methods To Establish Remediation Levels Adequate To
Protect Public Health

Methods of measuring the threat of contamination and the progress of the cleanup should be developed and utilized to determine when remediation efforts are sufficient to protect public health.

DOE has stated that it is not clear what levels of contamination will be considered "clean enough" to satisfy regulators. Some situations, notably contamination of soil and sediments by radionuclides, have not yet been addressed by Federal law. In many cases throughout the Weapons Complex, decisions about appropriate cleanup levels are likely to be controversial, largely because insufficient information exists to predict the health consequences of contamination. Reliable exposure data, including estimates of future exposure potential, would be helpful in such debates. If no one is exposed to, or likely to come in contact with, certain contaminants, there is at least the opportunity for careful study and discussion of alternative remediation strategies while the contaminants are securely stored and monitored.

In addition, methods of verifying the accuracy of risk estimates should be considered and applied to situations that present the highest risks or are attended by a great deal of uncertainty. There is no ready method for accomplishing this goal, but means of assaying the efficacy of remediation efforts, possibly involving ecotoxicological analyses, should be considered and developed to gauge the progress of the cleanup and to inform future remediation decisions.

- Excerpt B -

Enhance the Structure and Process for Assessing Potential Public Health Impacts From Weapons Complex Waste and Contamination

OTA has suggested that Congress could establish an institutional framework and process to effectively assess potential health impacts from the weapons facilities in order to evaluate the possibility of off-site health effects, develop health-based priorities, and address community health concerns.

This policy initiative could strengthen the assessment of potential off-site health impacts, improve the prospects that community concerns about possible off-site health effects are addressed, and provide a scientifically sound basis for developing health-based priorities. It could also help ensure that site-specific assessments provide a way to evaluate comprehensively the past, current, and potential public health impacts of contamination. A new structure and process could accelerate scientifically rigorous exposure assessments to determine the most urgent or significant health issues posed by the contaminants.

To implement this policy initiative, Congress could consider all or some of the following approaches:

1. Establish a new office to direct and coordinate Federal risk assessments, health assessments, State-organized health studies, and dose reconstruction projects.
2. Establish a new program to conduct site-specific assessments of whether and where weapons site contaminants pose a threat of exposure to the surrounding communities.
3. Establish a national, independent environmental health advisory board to provide guidance regarding exposure assessments, health effects evaluations, and health research needs.
4. Require DOE to make all information pertinent to possible health impacts, including data on past environmental releases and current contaminants, generally available.

1. Establish a New Office To Direct and Coordinate Federal Risk Assessments, Health Assessments, State-Organized Health Studies, and Dose Reconstruction Projects

No one agency or organization has the necessary authority to assess overall health impacts from Weapons Complex waste and contamination. There is virtually no coordination of CERCLA risk assessments, Agency for Toxic Substances and Disease Registry (ATSDR) health assessments, State-organized health studies, or dose reconstruction projects within or among the sites.

Although DOE's recently established Office of Epidemiology and Health would, among other responsibilities, conduct community health studies, the focus and scope of such studies are unclear. Even if funding and additional personnel slots are approved, it is uncertain whether DOE can successfully recruit the required staff in the near future. Also, any community health study designed, conducted, or supervised by DOE is unlikely to achieve public acceptance.

To improve the present structure and process, Congress could establish a new health assessment office to direct and coordinate comprehensive health assessments at Weapons Complex facilities and to coordinate with DOE, EPA, the Department of Health and Human Services (HHS), and State health departments on all matters of potential public health impacts from these facilities. The new office could also develop and implement a process for identifying community concerns about potential public health impacts and for obtaining broad public involvement in these assessments.

The first task of the new office should be to establish teams of environmental health experts (the health "Tiger Teams" described below) from government agencies, universities, and the private sector, to design and direct human exposure assessments at each of the weapons sites. The new office would be responsible for initiating and directing additional health studies, including dose reconstruction projects, based on the exposure assessment findings. These health studies could be designed and conducted by government staff or by scientists from universities and the private sector.

This approach addresses some of the deficiencies in the current structure and process of health assessments conducted by ATSDR and the States. For example, ATSDR is a small, understaffed agency, whose funds for conducting

CERCLA-mandated health assessments at the Weapons Complex come from DOE, with whom it must negotiate an agreement before an assessment can begin at any particular site. Because of its current limited resources, ATSDR health assessments are likely to be too cursory to determine the existence or seriousness of health risks posed by contamination, to provide a comprehensive baseline evaluation of current and potential public health effects, or even to identify areas in which more elaborate studies are required. State-sponsored site-specific health studies will vary considerably in comprehensiveness and sophistication. Not all interagency agreements incorporate funding for State-organized health studies. Also, although some States are planning to evaluate potential health effects at specific weapons sites, sufficient Federal funds may not be available to carry out such plans. Although a new Federal office might be viewed initially as impinging on State autonomy in health issues, it could ultimately help the States make more effective use of their resources by eliminating duplication and facilitating coordination among involved agencies.

By establishing a mechanism to direct and coordinate the various site-specific health studies, this initiative could strengthen the current approach to health effects evaluations. This would ensure that all important questions about possible off-site health impacts of weapons site contamination are addressed, that research designs are adequate to the many methodological challenges faced by environmental health studies, and that the multidisciplinary talent in environmental health available in government agencies, academia, and the private sector is effectively utilized. It could also help achieve timely and effective resolution of urgent or sensitive public policy issues.

The new office can perform these functions most effectively if it is adequately staffed and has sufficient independence. The new office could be established within HHS, possibly as a new and separate office within the Agency for Toxic Substances and Disease Registry, or as an independent center within the Centers for Disease Control. The office could report directly to the Secretary of HHS and to Congress. Alternatively, the office could be established within EPA and report directly to the EPA Administrator and to Congress. Or, the new office could be established as a separate entity outside of any existing agency, and report directly to Congress.

The new office should be given the time and resources to secure competent leadership and the necessary expertise to succeed and to be accepted by concerned communities. Giving the new office independent authority and funding would eliminate the need to use scarce personnel time to negotiate MOUs (memoranda of understanding) and funding levels with DOE operations offices and thus avoid delays in initiating health studies. If the new office is given the resources to function well, it could help ensure that site-specific health evaluations conducted at each site are comprehensive, scientifically sound, and credible to local communities. The office could also help avoid duplication of effort by different health agencies and encourage more efficient use of health experts or other scarce resources. In addition, it could provide an institutional memory for health-related lessons learned as the cleanup progresses.

There are important advantages to establishing an identifiable institutional focal point for weapons site health evaluations. By enhancing coordination and cooperation, the new office could promote a more efficient

use of resources and scientific talent. By providing an opportunity for input from all segments of the environmental health professional community, the new office could ensure that the most effective research designs are used. By establishing consistent policies for community involvement in all stages of the health assessment process and permitting early identification of community health concerns, the new office could enhance the credibility of the assessment process and more efficiently resolve the concerns of local communities. By determining which areas or sources of contamination may pose the greatest threat of off-site exposure, the new office could provide a sound and reliable basis for formulating health-based cleanup priorities. Finally, by reporting directly to Congress and having access to agency heads, the new office can achieve enhanced visibility and signal that health issues are receiving appropriate attention in the cleanup effort.

2. Establish a New Program To Conduct Off-Site Exposure Assessments

The proposed health assessment office described above could be required to establish health "Tiger Teams" to conduct rigorous, comprehensive health assessments of the potential for human exposure to current waste and contamination at each site. Recruiting personnel for health Tiger Teams from the limited pool of available experts who can do this work may take some time, so the effort should begin as soon as possible. Team members could be drawn from government agencies as well as from universities and the private sector. Teams could have a duration of 3 to 5 years and might be organized in a manner similar to the Technical Steering Panel of the Hanford Environmental Dose Reconstruction Project (HEDRP): When constituted, the Tiger Teams would require full and immediate access to weapons sites and all relevant data.

The health Tiger Teams could be directed to conduct several tiers of exposure assessments. Initial, first-cut assessments of any current contamination scenarios that might pose the risk of current or future human exposure could be made available in 6 to 12 months. If the teams discover situations that warrant immediate attention to protect public health, existing schedules, milestones, and funding priorities might have to be changed.

After the initial assessments, more refined studies could be performed as additional demographic and environmental monitoring data become available. Parallel with these efforts to assess the potential for exposure to current contaminants, separate exposure assessment teams could review source documents and historical emissions data to determine if further evaluation of historic releases or a formal dose reconstruction project is warranted.

Exposure assessments could better equip responsible agencies and the public with data that may be useful in developing and implementing health-based priorities in a timely manner. They could eventually provide a basis for developing a more workable, health-based priority system. Although health considerations are stated as top priority in the DOE Five-Year Plans, adequate data on potential health impacts are not available, nor does DOE have a strategy for acquiring or evaluating such data.

Exposure assessments conducted independently by health Tiger Teams could also guide Federal and State officials who negotiate interagency agreements in choosing among alternative schedules allowed under current laws and regulations. The assessments can also focus on problem areas that require

additional environmental characterization efforts or immediate attention through interim remediation measures. As additional exposure information is developed, parties can reevaluate schedules and milestones in that light.

3. Establish a National, Independent Environmental Health Advisory Board To Provide Guidance Regarding Exposure Assessments, Health Effects Evaluations, and Health Research Needs

A national independent advisory board could be established to provide advice and guidance with regard to health assessments and studies relating to the Weapons Complex. The board could be composed of experienced environmental health scientists and report to Congress and to the Secretary of HHS or the Administrator of EPA. The board could provide guidance regarding the methodology and design of exposure assessments and health effects evaluations. It could also provide advice on health research needs related to the cleanup. As one of its first tasks, the national board could review plans submitted by the health Tiger Teams for conducting exposure assessments.

Although it may be difficult for part-time advisers to grapple with the scope and complexity of weapons site issues, a prestigious national advisory board could still provide invaluable guidance and advice to decisionmakers. With its state-of-the-art environmental health knowledge and expertise, an independent, nongovernmental body could provide a structure for recognizing and coordinating health research needs, study designs, and strategies, and thereby advance the science of environmental health as it relates to problems posed by the Weapons Complex. The board could also provide advice and recommendations about the use of health assessment results to establish both short- and long-term health-based cleanup priorities.

4. Require DOE To Make Health Impact Information Generally Available

Congress could require DOE to make all data relevant to health impacts available to the scientific community without restriction or limitation. This would encompass data concerning past emissions and environmental releases, including previously classified data on these matters. In addition, Congress could require that the same information be made available to the general public.

At present, there are no clear requirements to ensure that health agencies such as ATSDR or State departments of health have access to DOE records relating to possible health impacts or to historical releases of radioactivity. Yet access to these records is important in understanding and assessing the potential impacts of existing contamination. Also, public perception of the scientific and political objectivity of health studies will be a major factor in its acceptance of reported findings or recommended actions. In the wake of growing indications that DOE failed to disclose past actions that endangered public health and withheld information on the adverse health effects of those actions, statements by DOE or other government agencies on the health effects of current waste and contamination are likely to be suspect. Without full disclosure of information relating to health, including information on past releases, the public will likely have little confidence in the reliability of current or future health studies.

This initiative could involve additional resource requirements for DOE. Staff will be required to collect historical records and review them for national security implications prior to declassification. In addition,

appropriate measures may have to be taken to minimize opportunities for misinterpretation. The investment of resources in this effort is important, however, if community concerns about health impacts are to be addressed. A community that has already experienced exposure may be at greater risk from current pollution than a community with no previous exposure. Until all information pertinent to total contamination exposure burdens on the population around sites is available, no reliable estimates can be made of relative health threats within and among sites. Release of this information should also bolster DOE's credibility and demonstrate its commitment to the "new culture" and to the protection of public health and the environment.

Mr. KOPETSKI. In a different area, in your report you talk about the fact that there may be some areas—at Hanford for example—where we may never be able to totally clean them up. I understand that. I understand that you are more worried about—there was an article just a couple of weeks ago in the Northwest papers about a particular tank—I don't know if you're familiar with this or not—but the expression apparently is, "It burped at the wrong time." The scientists did not anticipate that it would burp at this point. It confounded them, puzzles them, because these are dangerous activities. Apparently, scientifically you can sort of guess when there's some kind of regularity to this burping.

So this kind of scares me. When these things happen unanticipated, and if there's a clear and present danger today, how do we know it exists and that we should do something about it today?

Dr. JOHNSON. Well, there are situations in particular—what you're referring to—under ground, liquid high level waste tanks at Hanford. There are other situations at other places around the complex that could pose significant risks if something were to fail, such as the possibility of the explosions in the tanks. We haven't looked in detail at the specific questions of any one of these situations. But we have noted that the Department of Energy has had difficulty in the past predicting the environmental and health risks from their operations.

There are a number of conditions that need attention. One of the things that we thought would be most.

Mr. KOPETSKI Excuse me. When you say, "need attention", is that this year? Today?

Dr. JOHNSON. Very much so today. There is work going on investigating the single shell tanks and the explosion potential at Hanford. I don't know in particular (that case) exactly where it is right now. But there's work going on.

A lot of these are very complex technical questions. One of our concerns in the work that we did when we visited some of these sites was that the Department of Energy does not always have the very good technical oversight for some of the decisions that they're making in their waste management and environmental restoration program.

One of the suggestions that we had in our study was that it might be good to think about increasing outside oversight in the form of advisory boards at each of these sites with technical staff that could investigate some of these questions, and do it on a regular basis, and not just come in and out on an emergency basis.

There are enough situations at a number of these sites that they could use some good oversight—some good capable technical oversight—that it's not being done right now.

Mr. KOPETSKI. Thank you.

Mr. SCHEUER. Any final words, Sid?

Mr. MORRISON. Mr. Chairman, I would only assure my colleague from across the Colombia River that that tank has been watched for the last 15 years. And while there are still a number of scientific questions about the interaction of all the complex accumulation of chemicals within the tank, you're probably safer next to Hanford than you are next to the Umatilla Depot where the nerve gas is leaking.

Mr. KOPETSKI. It's a whole different issue.

Mr. MORRISON. Life is a series of risks.

Mr. SCHEUER. Well, on that high philosophical note, we'll terminate this panel with great thanks to you all. It was a very informative panel. We're grateful to you.

We'll now hear from Panel III, Mr. Dan Reicher and Mr. James Werner. Mr. Reicher is Senior Attorney for the Natural Resources Defense Council, and he will comment briefly on NRDC's views of the effectiveness of the Environment, Safety, and Health program, and then we'll hear from James Werner, who is Senior Environmental Engineer with the NRDC. Before that he was an engineer with ICF Technology Inquiry Service as a consultant for the DOE.

We'll ask you both to chat with us for about 5 minutes each. We're running very far behind and we still have another panel.

So let's start with you first, Mr. Reicher.

STATEMENT OF JAMES D. WERNER, SENIOR ENVIRONMENTAL ENGINEER, NATURAL RESOURCES DEFENSE COUNCIL, WASHINGTON, D.C.; ACCOMPANIED BY: DAN W. REICHER, SENIOR ATTORNEY, NATURAL RESOURCES DEFENSE COUNCIL, WASHINGTON, D.C.

Mr. REICHER. Thank you, Mr. Chairman.

I am Dan Reicher, a Senior Attorney with the Natural Resources Defense Council. NRDC has been actively engaged for more than 15 years in litigation, legislative work, and research regarding the U.S. nuclear weapons complex. In the mid-1980s, for example, we won a major case which established that the Federal hazardous waste laws apply to the DOE weapons plants.

I am pleased to introduce my colleague, Mr. Jim Werner, as you noted, Senior Environmental Engineer at NRDC. Prior to joining NRDC in 1989, Jim was an engineer with ICF Technology where he served as a consultant to the Department of Energy on environmental problems in the weapons complex. He therefore brings a great insight to the important issue your Subcommittee is addressing today, the current status and future direction of DOE's Office of Environment, Safety, and Health.

I would now like to turn to Jim to summarize our testimony and then I'll follow up with a final point.

Mr. WERNER. Thank you.

I would like to talk primarily today about the role of the Energy Department's Office of Environment, Safety, and Health in providing independent oversight over the Department's activities. First, let me try to put the Department's activities in context a little.

After 40 years of producing and testing nuclear warheads, we're only now learning about the environmental consequences of preparing for war. The final cleanup cost of this terrible legacy is now estimated by the Department of Energy and the General Accounting Office at more than \$100 billion. With this understanding, a new way of thinking is emerging.

Mr. SCHEUER. What cost?

Mr. WERNER. That's the total cost of cleanup environmental restoration, waste management—handling new waste—and corrective activities getting into compliance.

Mr. SCHEUER. Of what program?

Mr. WERNER. Of the Department of Energy.

Mr. SCHEUER. All right. Thank you.

Mr. WERNER. With this understanding, a new way of thinking is emerging in which security is defined to include environmental security. One of the lessons I think we have learned from the Department's problems is the crucial role of independent oversight both inside and outside the Department. If in years past we had in place an adequate system for oversight, perhaps we wouldn't be facing such monumental cleanup costs today.

External oversight means regulatory agencies like EPA and State equivalents perform inspections and levy fines and penalties when necessary. For many years, DOE resisted some of this outside scrutiny. Equally important, though, to avoid environmental problems, is the role of independent internal oversight within an agency. This is the role served by the Department of Energy's Office of Environment, Safety, and Health. This office tries to assure that operations comply with environmental standards and are conducted in an environmentally sound way.

I want to contrast this role with another environmental office within the Energy Department. That's the Office of Environmental Restoration and Waste Management headed by Leo Duffy. That's the office that Clyde Frank is part of, who was here on an earlier panel. This office and the Environment, Safety, and Health Office are shown in the organizational chart on Page 6.

The mission of this office, the Environmental Restoration and Waste Management Office, is to actually manage and perform the cleanup tasks. The fiscal year 1992 budget request for this office is more than \$4 billion, compared to a request for the ES&H Office of about \$159 million.

We're concerned that the ES&H Office may not have adequate resources to perform this crucial internal oversight function. Moreover, recent reorganization within DOE that resulted in a new office may have weakened the ES&H Office.

Within the Environmental Restoration and Waste Management Office, the reorganization that recently occurred established a new office of Quality Assurance and Quality Control. It has the mission of providing independent internal oversight. Unfortunately, an office inside the Environmental Restoration and Waste Management Office cannot perform independent internal oversight because it reports to a senior manager whose job it is to do something other than oversight. In addition, this office has siphoned off many of the staff and many of the resources previously in the ES&H office.

In the 1980s, while environmental enforcement in the Government was at an ebb, private corporations were still performing their own internal environmental audits to check on environmental problems at various manufacturing plants. These internal audits would help catch problems before they got out of control and became more expensive to correct. The auditors report directly to corporate headquarters, not to the plant manager or the vice president for manufacturing. We've included a clipping from the last Sunday's *New York Times* magazine, business section, on private corporations having this kind of internal oversight.

The job of performing independent internal oversight will continue to be important in the Environmental Restoration and Waste Management activities, which as we mentioned are estimated to cost more than \$100 billion. The ES&H Office can serve an important role in assuring that those dollars are spent effectively. An investment in the ES&H Office in 1991 can prevent a great scandal in 1999.

What it really comes down to, Mr. Chairman, is that we'd like to see prevented here by beefing up the ES&H Office, so that we don't see a *New York Times* headline some years down the road that says, "Study Finds That Bomb Plant Cleanup Now Estimated at \$500 Billion Instead of \$100 Billion: \$30 Billion Wasted on Ineffective Cleanup." We want to avoid that kind of scandal. We can do that with some good oversight.

In order to prevent this tragedy from unfolding, this Subcommittee should first ensure that the ES&H Office has adequate resources to carry out its critical independent oversight mission. Second, this Subcommittee should also consider strengthening the ES&H Office by codifying the position of the Assistant Secretary for ES&H. Third, the Subcommittee should direct DOE to declassify any environmental information that would not threaten national security. And finally, this Subcommittee should ensure that the Tiger Team investigations are being followed up adequately to ensure that actions to correct the problems identified occur.

Let me turn it back over to Mr. Reicher to complete our testimony.

Mr. REICHER. Mr. Chairman, I would like to take just the remaining few seconds to alert the Subcommittee to an effort underway in the ES&H Office that could seriously undermine the Department's compliance with the National Environment Policy Act.

NEPA's Environmental Impact Statement requirement has been critical in citizen and congressional efforts to expose the serious environmental and safety problems in the nuclear weapons complex, especially in light of the fact that the Nuclear Regulatory Commission has no enforcement authority, and EPA has little enforcement authority against DOE facilities.

In November of last year, the ES&H Office proposed a set of regulations that would exempt from a NEPA review a great number of activities in the weapons complex. These include, for example, the restart of nuclear reactors that have been shut down because of safety problems, and the removal of unlimited quantities of radioactive material from contaminated processing plants.

We were very pleased in 1989 when Secretary Watkins stated that, "If the Department is to err in its judgement as to the extent of NEPA review required of new projects, it will err on the side of full disclosure and complete assessment of potential environmental impacts." DOE's ES&H Office must alter the approach it has taken in the proposed NEPA regulations if it is to honor the Secretary's commitment.

Jim and I appreciate the opportunity to testify today, and we would be pleased to take your questions.

[The prepared statement of Mr. Werner and Mr. Reicher follows:]



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STATEMENT OF

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AND

DAN W. REICHER, ESQ.

ON BEHALF OF

THE NATURAL RESOURCES DEFENSE COUNCIL

BEFORE

THE COMMITTEE ON SCIENCE AND TECHNOLOGY
SUBCOMMITTEE ON ENVIRONMENT

U.S. HOUSE OF REPRESENTATIVES

REGARDING

THE DEPARTMENT OF ENERGY'S
OFFICE ON ENVIRONMENT, SAFETY AND HEALTH

March 7, 1991

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My name is Jim Werner. I am a Senior Environmental Engineer with the Natural Resources Defense Council (NRDC). Prior to joining NRDC in 1989 I was an engineer at ICF Technology, Inc., where I served as a consultant to the Department of Energy performing hazardous waste field investigations at DOE facilities throughout the United States. I have also provided environmental consulting services to the Environmental Protection Agency (EPA), the Congressional Office of Technology Assessment, and a variety of private corporations. I have a Masters degree in Environmental Engineering from The Johns Hopkins University and have authored numerous technical and policy articles on the costs and technologies of hazardous waste cleanup.

Also testifying today is Dan W. Reicher. Dan is a senior attorney with NRDC and Director of NRDC's Defense and Environment Project. Prior to joining NRDC in 1985, Dan was an assistant attorney general for environmental protection in the Commonwealth of Massachusetts, a law clerk to a federal district court judge, a staff member of the President's Commission on the Accident at Three Mile Island, and a legal assistant in the hazardous waste section of the U.S. Department of Justice. Dan has recently served as a consultant to the Department of Energy's Sandia National Laboratory regarding nuclear waste and as an advisor to the Congressional Office of Technology Assessment regarding cleanup of the weapons complex. He is a graduate of Stanford Law School and Dartmouth College.

I would also like to acknowledge the assistance of Ms. Karen Current in reviewing and revising this testimony. Karen joined NRDC in 1990 and is a graduate of the University of Delaware.

NRDC is a national environmental organization with over 170,000 members and contributors and a staff of over 175 lawyers, scientists, environmental specialists and support personnel at offices in New York, Washington, San Francisco, Los Angeles, and Honolulu. NRDC pursues a broad range of environmental, energy, and defense issues. The organization has long been concerned about safety and environmental problems at Department of Energy (DOE) nuclear facilities. Over the past twelve years, NRDC has won a number of lawsuits to enforce federal environmental laws at DOE facilities including Hanford, Washington; Oak Ridge, Tennessee; and the Savannah River Site, South Carolina.

We are pleased to have this opportunity to present our views on the Department of Energy's Office of Environment, Safety and Health and its FY 1992 Budget Request.

SUMMARY

The Department of Energy's (DOE's) Office of Environment, Safety and Health (ES&H) has, more than any other part of DOE, been the environmental conscience of an agency that has been increasingly criticized for neglecting environmental concerns. We have long supported the efforts of this office. However, we are concerned that, ironically, as the resources DOE devotes to environmental problems increase, the important oversight function of the ES&H office may not be keeping pace.

A recent DOE reorganization, which established a new office of Environmental Restoration and Waste Management, did not adequately consider the important independent internal oversight role served by the ES&H office. This oversight role has become increasingly important as DOE has undertaken additional environmental activities in recent years, in particular a mass cleanup program and "Tiger Team" assessments of individual facilities. Further, there are additional tasks, such as review of DOE's environmental priority setting and information declassification, that may be appropriately assigned to the ES&H office. Certainly, enhanced internal oversight by the ES&H office is no substitute for fully independent external oversight by EPA and state agencies, but it will be a crucial element of any genuine turnaround in the Energy Department's checkered

environmental past. Finally, despite the Department's recent commitment to improve compliance with the National Environmental Policy Act (NEPA), regulations recently proposed by the ES&H office would exempt from NEPA review many Department activities with the potential for significant environmental effects.

DOE should take the following actions to address these problems:

1. DOE Should Reaffirm and Strengthen the Independent Internal Oversight Role of its Environment, Safety and Health Office;
2. DOE Should Establish a Permanent Audit Program to Provide Ongoing Oversight and Ensure that "Tiger Team" Findings are Acted Upon Expeditiously;
3. DOE's Office of Environment, Safety and Health Should Ensure that Proper Priorities are Established to Meet the Legitimate Environmental Needs of the Department;
4. DOE Should Review its Classification System and Release all Information That Would Not Jeopardize National Security; and
5. DOE Should Reconsider Its Proposal to Exempt Many Department Activities From Review under the National Environmental Policy Act.

INTRODUCTION

In 1985, then Energy Secretary John Herrington announced a reorganization of the Department's environmental, safety and health functions as part of his "Three-Point Plan". Four years later, DOE Secretary Watkins announced his own reorganization, adding a new Office of Environmental Restoration and Waste Management (ERWM) to carry out the DOE's massive environmental programs, which are estimated to cost more than \$100 million over the next thirty years. The relationship between these two environmental offices is illustrated in Figure 1. The FY 92 budget request for the Department's ERWM office is \$4.2 billion. The FY 92 ES&H budget request is \$159.67 million.

A. DOE SHOULD REAFFIRM AND STRENGTHEN THE INDEPENDENT INTERNAL OVERSIGHT ROLE OF ITS OFFICE OF ENVIRONMENT, SAFETY AND HEALTH.

In this section, we discuss our concerns regarding the two primary elements of the Energy Department's Office of Environment, Safety and Health (ES&H). First, we consider the appropriate role of the ES&H office in providing independent internal environmental oversight, and the extent to which ES&H is fulfilling that mission. Second, we review the transfer of safety oversight functions from ES&H to other program offices and the potential conflicts of interest arising from that reorganization.

1. Environmental Oversight by the ES&H Office

With the announcement of Secretary Watkins' Ten Point Plan¹ and DOE's "Environmental Restoration and Waste Management (ERWM) Five Year Plan²" in 1989, the Energy Department proposed a reorganization to centralize responsibility for carrying out environmental activities.³ In August 1989, Secretary Watkins approved a plan for implementing this reorganization⁴, and appointed Leo Duffy as the first director of the Office of Waste Management and Environmental Restoration⁵. The responsibilities of this office include waste management, corrective activities, and environmental restoration programs. Although this reorganization has helped consolidate and coordinate these environmental program activities, we are concerned about its impact on the existing Office of Environment, Safety and Health (ES&H).

¹ Watkins, James D., "Ten Point Plan", June 27, 1989.

² DOE, Environmental Restoration and Waste Management Five-Year Plan, DOE/S-0070, August 1989 ("Five Year Plan").

³ 1989 Five Year Plan at 22.

⁴ Duffy, Leo P., Action Memorandum to the Secretary. "Establishment of an Organization to Implement the Environmental Restoration and Waste Management Five Year Planning Initiative," August 3, 1989.

⁵ Barber, Jeff, Inside Energy, "DOE Seeks New Assistant Secretary Post", October 9, 1989.

The Energy Department ES&H office helps ensure environmental compliance among DOE program and field offices by providing guidance and oversight. These roles are known, in modern management terms, as "staff" functions. They are in contrast to "line" functions, which involve actually managing and carrying out operations. Virtually all major industrial corporations recognize the importance of separating line and staff responsibilities (See Attachment A). Without effective separation of these functions, oversight cannot be truly independent and therefore cannot be effective.

Internal staff functions are especially important at the Energy Department because of substantial obstacles to effective external oversight, including chronic understaffing of EPA and state regulatory agencies, and the legal difficulties these agencies face in issuing compliance orders and imposing fines and compliance schedules.

Internal oversight also serves a different function from external oversight. Internal oversight is intended to anticipate problems before they occur. External oversight, on the other hand, is intended primarily to identify problems that may constitute statutory or regulatory violations. By then, the environmental damage may already be done and the cost of correcting it already accrued. Hence, the Department's ES&H office is a sound financial investment not only because it can

help avoid legal problems, but also because it can help reduce costs resulting from neglected environmental problems.

Unfortunately, the recent reorganization of the ERWM office has diminished the ES&H oversight role. An internal Energy Department memorandum, and DOE's second five-year environmental plan⁶, refers to the establishment of "independent internal oversight" in the Office of Environmental Quality Assurance/Quality Control (QA/QC) within the ERWM office. (See Figure 2).⁷ This office has been established largely by transferring technical staff from the ES&H audit office. However, because this QA/QC office reports to the same senior DOE manager responsible for the ERWM program, it cannot offer the same independent internal oversight as ES&H. Also, Regulatory Compliance groups have been established under the Deputy Directors within the ERWM office. The relationship between these groups and the existing functions in the Office of Environment, Safety and Health is unclear.

The basic problem revealed by these documents is that the ERWM office is responsible for both carrying out line functions

⁶ DOE, "Environmental Restoration and Waste Management Five Year Plan; FY 1992-1996", DOE/S-078-P, p. 34, June 1990.

⁷ Duffy, Leo P., DOE Memorandum to The Secretary: "Establishment of an Organization to Implement the Environmental Restoration and Waste Management Five Year Planning Initiative," August 1989.

such as environmental cleanup, compliance and waste management activities, and the staff function of overseeing that the cleanup is performed properly. The environmental cleanup and compliance work needed at Energy Department facilities is on par with some of the largest projects in American history such as the Apollo space program and the savings and loan bailout. Hence, it makes sense to separate the program office whose mission is to carry out the environmental improvements from the office whose responsibility is to oversee program office activities. As in other mission-oriented offices within DOE such as Defense Programs and Nuclear Energy, the line function of implementing environmental programs by the ERWM office should not be confused with the important oversight function now handled by the ES&H office.

Effective ES&H oversight of expanded ERWM environmental functions will require increased resources. The ERWM budget has grown from \$2.2 billion in 1990 to more than \$4.5 billion in 1992. However, the budget of the ES&H office has not been similarly expanded, growing from \$112 million in FY 1990 to just \$159 million in proposed FY 1992 budget. In light of the prospect that the overall costs of the cleanup of the weapons complex will exceed \$100 billion⁸, it is vital that from the

⁸ Environmental Restoration, Waste Management and Corrective Activities are totalled to derive the \$100 billion estimate for DOE "cleanup".

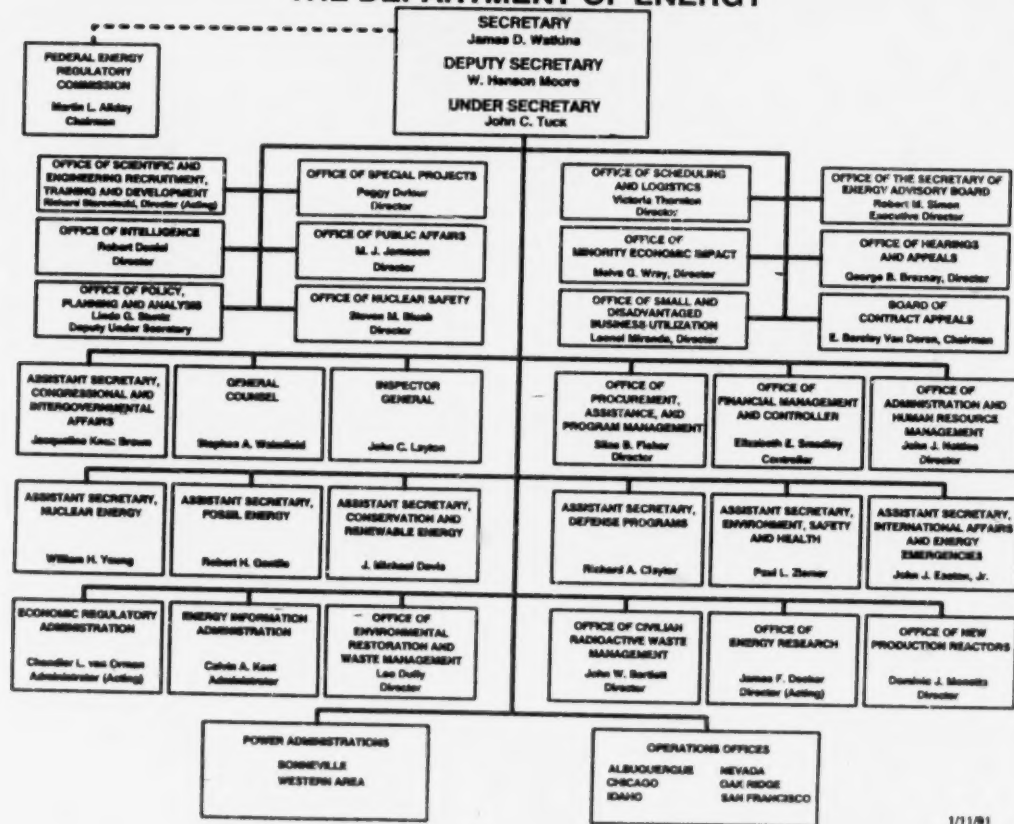
beginning adequate resources are allocated to provide effective internal oversight in order to avoid mismanagement and wasted funds. A scandal in 1999 may be avoided by timely investment in the ES&H office in 1991.

A reinvigorated and better-funded ES&H office should play an expanded role in overseeing a number of ERWM activities. First, two major facilities are now entirely controlled by the ERWM office - the Hanford Site in Washington and the Fernald facility in Ohio⁹. Many of the management and operations functions previously carried out by the Defense Programs office at these sites have simply been transferred to the ERWM office as the new "landlord." These functions include operation of chemical processing facilities such as the PUREX plant at Hanford¹⁰ as well as more routine day-to-day operations such as building construction and equipment maintenance. These activities continue to have the same potential for significant environmental impacts, after they are transferred to ERWM control, as they did when another DOE office, such as Defense Programs, controlled the sites.

⁹ These facilities are known in the FY 1992 Congressional Budget Request as Richland Operations in Washington State and Feed Materials Production Center in Ohio.

¹⁰ Known as the "PUREX" plant, the Plutonium Uranium Extraction Plant was constructed in the early 1950's to extract weapon-grade plutonium from spent fuel rods. In FY 1991 DOE transferred responsibility for operating PUREX to the ERWM office.

FIGURE 1
THE DEPARTMENT OF ENERGY



For example, chemical processing operations annually generate hundreds of thousands of gallons of radioactive and hazardous chemical waste. Similarly, construction and renovation of many buildings often disturbs wetlands or requires air and water permits, and equipment maintenance generates waste solvents, oil, and paint sludges. Although the ERWM office has an environmentally-oriented mission, this does not guarantee that all activities will be carried out properly. To ensure that these activities are performed with adequate consideration of environmental, safety and health risks, the ES&H office should perform vigorous oversight of ERWM facilities and activities.

A second example of the need for a strong oversight role by the ES&H office of ERWM activities is in worker health and safety. Cleaning up hazardous and radioactive wastes is often an inherently dangerous activity requiring scrupulous attention to the health and safety of workers. For example, prior to working on a hazardous waste cleanup operation, workers must receive training in compliance with Occupational Safety and Health Act requirements. These requirements, established by the 1986 Superfund amendments¹¹, are enforced by the Occupational Health and Safety Administration (OSHA). Unfortunately, OSHA has no legal authority over DOE facilities. Until this authority is

¹¹ Superfund Amendments and Reauthorization Act of 1986, Section 126.

established, the ES&H office could play a vital role in ensuring that hazardous waste cleanup workers are properly trained.

Finally, the massive cleanup operations that will occur at DOE facilities will require extensive planning involving thousands of "Remedial Investigation/Feasibility Studies" under the Superfund law and "Closure" and "Corrective Action" studies under RCRA. Documents such as these serve essentially as blueprints for planning the cleanup. Errors in the planning stage can result not only in the waste of billions of dollars of cleanup funds, but actually exacerbate environmental problems. In light of the extreme shortage of resources within EPA and state oversight agencies for reviewing these planning documents, a strong ES&H role in overseeing ERWM cleanups is even more critical.

2. Safety Oversight by the ES&H Office

In May, 1989 the Energy Department announced a reorganization that shifted internal nuclear safety oversight out of ES&H into three program offices -- Defense Programs, Nuclear Energy, and Energy Research.¹² This reorganization represented a significant backsliding in the progress that was made in

¹² Secretary of Energy Notice SEN-6-89, "Departmental Organization and Management Arrangements", May 1989, and SEN-6A-89, September 28, 1989.

previous years to establish some accountability in Department program offices. In fact, when then DOE Secretary Herrington announced an earlier reorganization in 1985, he stated that "[a]t present, oversight responsibility for environment and safety is scattered among the Assistant Secretaries. [O]versight responsibility for the environment, safety and health function will be consolidated and upgraded...."¹³ Secretary Watkins' reorganization reversed this earlier decision, which was one of the most positive developments in the previous Energy Department.

The proposed elimination of internal safety oversight within ES&H was criticized by former Nuclear Regulatory Commission Chairman John Ahearne, now Chairman of the DOE Advisory Committee on Nuclear Facility Safety. Commenting on the proposed reorganization on behalf of the Advisory Committee, Mr. Ahearne indicated that, although "prime responsibility for safety and environment should rest with line management, we believe that it is equally important to maintain a strong, independent oversight function."¹⁴ Transferring ES&H responsibility to the program offices would not accomplish this because of the inherent conflict between the mission function and the oversight function.

¹³ Herrington, John S., DOE News: "Herrington Announces 3-Point Plan to Strengthen Environment, Safety and Health Programs", R-85-111, at 1, September 18, 1985.

¹⁴ The Energy Daily, Volume 17(167), "Ahearne Hits Reorganization Plan", at 1, September 1, 1989.

The proposed reorganization was also criticized from within the Energy Department. In 1989, we obtained copies of letters written by a nuclear engineer, Darrell A. Huff, who was in the Department's ES&H Office of Safety Appraisals.¹⁵ Mr. Huff noted that the reorganization would not only fail to provide effective oversight, but would also be inefficient because of the duplication of technical capabilities. Previously, technical specialists from ES&H provided oversight of multiple program offices. As a result of the reorganization, however, specialists could no longer be shared by programs. According to Mr. Huff, "instead of hiring 6 seismic experts across three separate safety organizations [Defense Program, Nuclear Energy and Energy Research], you may only need 4 such experts in a single organization". He concluded, "I do not believe that...the proposed self-assessment organizations...are sufficiently independent of the financial and production pressures such that these organizations could function as truly independent entities."¹⁶

In response to concerns about jeopardizing the independence of oversight by placing oversight function within program

¹⁵ Huff, Darrell A., Letters to Representative Harley O. Staggers (June 1, 1989 and July 20, 1989) and Senator Jay Rockefeller (October 27, 1989). Mr. Huff is a resident of West Virginia.

¹⁶ Huff, October 27, 1989.

offices,¹⁷ the Department amended the May 1989 proposal to include an Office of Nuclear Safety, reporting directly to the Secretary. This office is responsible for "advis[ing] the Secretary of whether line management and its self-assessment functions are adequately assuring nuclear safety."¹⁸ Because this office reports directly to the Secretary of Energy, it provides essentially the same independent oversight as the ES&H safety office. But the \$12.5 million requested for the Nuclear Safety office for FY 1992 is substantially less than was devoted to this task prior to being transferred out of ES&H.

Self-assessment may complement, but cannot replace, the independent internal oversight role now served by the Nuclear Safety office. Unfortunately, in the wake of the Secretary's reorganization, most of the technical resources in DOE's former ES&H Office of Safety have been transferred to various program offices (e.g., Defense Programs) rather than the Office of Nuclear Safety for independent oversight. We believe that the independent oversight function should be given a higher priority.

¹⁷ See Werner, J.D. and D.W. Reicher, "Testimony Before the Senate Committee on Governmental Affairs", November 14, 1989.

¹⁸ SEN-6A-89 at 4.

- B. DOE SHOULD ESTABLISH A PERMANENT AUDIT PROGRAM TO PROVIDE ONGOING OVERSIGHT AND ENSURE THAT "TIGER TEAM" FINDINGS ARE ACTED UPON EXPEDITIOUSLY.

As part of the 1989 environmental initiatives announced by Secretary Watkins, the Energy Department began a series of "Tiger Team" inspections of its facilities. Coordinated by the ES&H Office of Special Projects, Tiger Team assessments involve detailed review of environmental, safety and management performance at DOE facilities. More than 15 Tiger Team assessments have been completed since June 1989 (see Attachment B). This laudable ES&H office program has required the efforts of hundreds of DOE and contractor professionals working long hours at very complex facilities. To some extent, this program has been an extension and expansion of the previous "Environmental Survey" program conducted from 1986 to 1989.¹⁹ However, instead of focussing only on environmental issues as the Surveys did, the Tiger Teams have also considered safety and management issues.

DOE's Tiger Teams have identified hundreds of environmental, safety and management problems at DOE facilities. However, the follow-up to these findings has been woefully inadequate. The sites often submit incomplete or deficient Action Plans in

¹⁹ See e.g., DOE, "Environmental Survey Preliminary Report: Hanford Site", DOE/EH/OEV-05-P, August 1987.

response to the findings. Even more troubling, there is an inadequate system in place to ensure that the Action Plans are carried out. At some sites, "self-assessment" offices have been established to fill this role, but these offices are understaffed. At many sites they are entirely absent. To avoid wasting the Tiger Team effort, DOE should immediately put in place a system to ensure that necessary follow-up actions occur at all sites.

In addition, DOE should establish a long-term continuing audit function within the ES&H office. The Environmental Survey and the Tiger Team efforts have been valuable tools for beginning to address DOE problems. The Tiger Team assessments, however, are one-time efforts. DOE needs to give them a continuing role by having ES&H return to sites where Tiger Team assessments have been conducted to ensure that the old problems have been resolved and that new problems have not arisen. Unfortunately, it is not clear from DOE's FY 1992 budget request or other planning documents that the Department plans such a continuing ES&H audit function. The Department's FY 1992 budget request includes \$1.5 million for audits at "sites which will not be subjected to Tiger Team Assessments" and twelve line management audits.²⁰ DOE

²⁰ DOE, "Congressional Budget Request, Energy Supply Research and Development, Volume 2", DOE/CR-0001, February 1991, at page 216.

should, at a minimum, make explicit its plans for the ES&H audit function.

C. DOE's Office of Environment, Safety and Health Should Ensure that Proper Priorities are Established to Meet the Legitimate Environmental Needs of the Department.

In light of the massive environmental programs being planned by the Department, difficult decisions about priorities will be required to distribute limited resources. The Energy Department is developing various systems for establishing priorities among competing environmental projects. Prioritization decisions may be based on explicit formalized computer models, or general policy views, but some type of independent review is needed to ensure that the resulting priorities and resource allocation are appropriate.

The ES&H office should be given the task of independently reviewing the Department's environmental priorities. First, it should review the distribution of funds between DOE's various environmental programs - environmental restoration, waste management, and corrective activities -- to ensure that funds are not being unreasonably diverted from cleanup needs to support weapons production. Second, the ES&H office should provide an independent review of ERWM priorities within these environmental programs to ensure, for example, that cleanup priorities are

appropriate to meet the requirements established by agreements such as the Hanford TriParty Agreement.

According to DOE's latest estimate, the overall cost for cleanup of existing waste sites ("environmental restoration") is \$42.6 to \$72.8 billion²¹. This is substantially more than the cost for handling newly generated waste or building new waste facilities ("waste management") which DOE estimates to be \$25.3 billion. Yet, nearly 60 percent of DOE's FY 1992 environmental budget request is devoted to waste management, while only 30 percent is devoted to environmental restoration. Generally, the annual budget request for an activity should reflect the long-term funding needs for that activity, unless there is an overriding technical or policy reason to alter this allocation. Although we believe that many waste management activities are important, we are concerned that environmental funds are being diverted from critical cleanup tasks to waste management supporting certain nuclear weapons production activities of questionable value.

One example of DOE's skewed emphasis on waste management is its proposal to construct multi-million gallon "bladders" or "Liquid Effluent Retention Facilities" (LERFs), at a cost of approximately \$20 million each, to contain liquid radioactive and hazardous mixed waste produced at the Hanford PUREX plant. The

²¹ Department of Energy, "Environment, Safety, and Health Needs of the U.S. Department of Energy, Volume 1: Assessment of Needs" (DOE/EH-0079), December 1988.

PUREX plant has been shut down since December 1988 due to safety problems. DOE announced in October 1990, in the wake of a Notice of Intent to Sue filed by NRDC,²² that it would prepare an Environmental Impact Statement to determine the future of the plant. Given the many other pressing environmental cleanup and compliance projects, and the serious question about the need for and safety of operating the PUREX plant, construction of these LERFs to accommodate additional wastes does not seem like an appropriate priority. To the extent that operation of PUREX is unnecessary, construction of the LERFs is also unnecessary.

It is a well-accepted waste management principle that the most effective waste management technique is "source reduction," i.e., elimination of a waste source in order to avoid generating the waste in the first place.²³ The Energy Department should first make a full and honest appraisal of whether it is necessary to generate a waste before it proposes to spend money to manage the waste using "end of the pipeline" fixes.

To avoid setting unsound priorities, DOE should develop an explicit system for establishing priorities for waste management

²² The Notice Letter was filed on behalf of NRDC, the Hanford Education Action League and the Nuclear Safety Campaign.

²³ Office of Technology Assessment, "Serious Reduction of Hazardous Waste", OTA-ITE-318, September 1986; Sarokin, D. et al., "Cutting Chemical Waste" INFORM, New York, NY 1985; Office of Technology Assessment, "Technologies and Management Strategies for Hazardous Waste Control", OTA-M-196, March 1983.

and technology development projects subject to public review. The ES&H office should have a role in reviewing the resulting environmental priorities to ensure that they are appropriately established.

D. DOE SHOULD REVIEW ITS CLASSIFICATION SYSTEM AND RELEASE ALL INFORMATION THAT WOULD NOT JEOPARDIZE NATIONAL SECURITY.

One of the primary causes of the terrible environmental problems resulting from 45 years of nuclear weapons production has been the historic lack of independent oversight by outside regulatory agencies and the public. This scrutiny has been thwarted in part by the veil of secrecy that has hidden much of the government's activities. There is clearly some information that should legitimately remain classified for national security reasons. But, as a former DOE contractor holding a "Q-level" security clearance for nearly three years, I can tell you that great deal of information seemed to be classified or restricted only because it was embarrassing, not because there was any national security risk that would result from its disclosure.

For example, DOE restricts from public availability some of its environmental documents submitted to regulatory agencies for operating hazardous waste landfills and treatment facilities. Similarly, the Probabilistic Risk Assessments for DOE nuclear reactors are routinely withheld. Because this information is

unavailable, public scrutiny of the environmental and safety implications of cleanups and reactor operations is restricted.

The ES&H office may serve a useful role in ensuring that this kind of environmental, health and safety information is not withheld from the public without a legitimate national security justification. One place for ES&H to start would be the Programmatic Environmental Impact Statements (PEIS), which DOE agreed to prepare on the nuclear weapons complex in January, 1990, in the wake of an NRDC lawsuit.²⁴ At the time of the announcement, the New York Times quoted Energy Department Under Secretary John Tuck as saying, "'[b]y the very nature of the [PEIS] processes there will be far greater understanding of the complex and its functions than has previously been the case. No question.'" According to the article, in order to accomplish this important goal, Mr. Tuck indicated that DOE "will need to declassify many documents to fulfill the requirements of NEPA."

The Department has yet to begin to release the information necessary for meaningful public participation in the PEIS process. Given its responsibility for ensuring compliance with the National Environmental Policy Act (NEPA) (pursuant to which the PEIS's are being prepared) ES&H should work to see that Mr. Tuck's commitment is honored. The public cannot be a responsible

²⁴ NRDC filed this lawsuit on behalf of itself and 21 other citizens' organizations.

participant in critical DOE decisions unless it has available all of the information relevant to nuclear weapons production which would not harm national security by its disclosure.

In order to eliminate unnecessary secrecy, a thorough review of DOE's classification system is required, to determine where existing classification rules, procedures, and organizational systems are hindering Secretary Watkins' new culture of openness. It may be appropriate for the ES&H office, to have a role in performing this review.

More than five years ago, the President's Blue Ribbon Task Force on Nuclear Weapons Program Management stated that:

One of the national security responsibilities of DOE leadership is to make available sufficient information to allow informed public debate on nuclear weapon issues. The Task Group urges that DOE review its classification procedures to ensure that criteria are based upon current requirements rather than historical precedent.²⁵

The time for accomplishing this review has long passed.

E. DOE SHOULD RECONSIDER ITS PROPOSAL TO EXEMPT MANY DEPARTMENT ACTIVITIES FROM REVIEW UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT

In November of last year, DOE's ES&H office proposed a complete revamping of the Department's regulations implementing the National Environmental Policy Act (NEPA). 55 Fed. Reg. 46444

²⁵Report of the President's Blue Ribbon Task Group on Nuclear Weapons Program Management, July 1985, p. 13.)

(November 2, 1990). NEPA requires federal agencies to analyze in an Environmental Impact Statement (EIS) the impacts of and alternatives to any major federal action with the potential for significant effects on the human environment. NEPA's EIS requirement is particularly important for DOE activities because there are few other mechanisms available to the public to ensure the Department's accountability in the weapons production complex. Unlike commercial facilities, the DOE complex is exempt from NRC oversight. While NRC regulations provide for formal public involvement and rights of appeal in proceedings regarding commercial nuclear facilities, DOE has unfortunately not provided similar opportunities under the complex system of internal orders by which it administers its own facilities. NEPA has become a substitute, although not an adequate one, for the public oversight which has been missing in the weapons complex for so long.²⁶

This subcommittee should take particular note of the changes DOE has proposed in its NEPA regulations. While the proposed regulations represent a positive step forward in certain

²⁶ The Defense Nuclear Facilities Safety Board, recently created by Congress in part to end the secrecy in the weapons complex, has unfortunately gone out of its way to exclude the public from its proceedings. This necessitated litigation by NRDC and the Energy Research Foundation to force the board to comply with the Government-in-the-Sunshine Act and the Freedom of Information Act. ERF, NRDC v. Defense Nuclear Facilities Safety Board, No. 90-5096 (D.C. Cir. 1990).

ways, they are seriously flawed in many respects.²⁷ Most disturbingly, they would exempt completely from even the most basic NEPA analysis many DOE actions which clearly have the potential for significant environmental effects. For example, DOE proposes to exempt from any NEPA review the restart of a major facility such as a nuclear reactor or chemical processing plant which has been shutdown for up to two years or longer because of safety problems and which has undergone substantial renovations²⁸. This proposed exemption is not only illegal but is at odds with DOE's decisions involving several of its own facilities.

The law of the D.C. Circuit confirms that an EIS is required for the restart of reactors and processing plants. As stated in NRDC v. Vaughan, 566 F.Supp. 1472, 1475 (D.D.C 1983):

As a general proposition it appears that the start-up of any nuclear reactor is treated as a "major" federal action requiring consideration of environmental effects of an order of magnitude appropriate to their "significance," see Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 538-39 (1978); Baltimore Gas & Electric Co. v. NRDC, [462 U.S. 87] (1983), even restarts of dormant reactors which have previously been the subjects of environmental impact statements. Metropolitan Edison Co. v. PANE, [460 U.S. 766, 769, n.1 (1983)] (emphasis added.)

²⁷ NRDC's views on the proposed regulations are presented in detail in comments filed with DOE on December 17, 1990.

²⁸ 55 Fed. Reg. 46460, November 2, 1990.

In accord with this general proposition, Judge Jackson held in Vaughan that an EIS was required for the restart of one shutdown Savannah River reactor -- even when three others were operating.

People Against Nuclear Energy v. NRC, 678 F.2d 222 (D.C. Cir. 1982), rev'd on other grounds sub nom. Metropolitan Edison Co. v. PANE, 460 U.S. 766 (1983) ("PANE"), which is cited in Vaughan, is also directly applicable. PANE involved the restart of the undamaged Three Mile Island Unit 1 reactor ("TMI-1") after the 1979 accident at Three Mile Island Unit 2 ("TMI-2"). In the Court of Appeals, petitioner PANE argued that the restart of TMI-1 was a major federal action and that the NRC "must comply with NEPA before it decides whether to authorize start-up of TMI-1's operations." Id. at 231. The court agreed that the decision on whether to allow the resumption of operations was subject to NEPA. Id. The case was remanded to NRC to determine whether a supplemental EIS on the issue of psychological damage was required.

On review, the Supreme Court reversed the decision below on the ground that the purely psychological impact of start-up on the local populace was not cognizable under NEPA. However, it explicitly declined to reach the D.C. Circuit's holding that restart involved a major federal action, 460 U.S. at 771 n. 5, and stated that:

The federal action that affects the environment in this case is permitting renewed operation of TMI-1. The direct effects on the environment of this action include release of low-level radiation, increased fog in the Harrisburg area (caused by operation of the plant's cooling towers), and the release of warm water into the Susquehanna River....Another effect of renewed operation is a risk of a nuclear accident. Id. at 775. (emphasis added, footnote omitted).

It is clear therefore that the law does not permit DOE to adopt a regulation which would exempt facility restarts from NEPA review.

DOE must also acknowledge its own practice of preparing EISs prior to restart of plants that have been shut down because of safety or environmental problems. In addition to the L Reactor EIS that resulted from the Vaughan case, DOE has decided to prepare EISs on several other plants that were shutdown because of safety/environmental problems and were the subject of modifications. These include: the Hanford N Reactor (EIS was not completed after decision made to mothball plant); the Hanford PUREX chemical processing plant; the three remaining Savannah River reactors (final EIS issued December, 1990); and the Fernald uranium processing plant.

DOE's ES&H Office also proposes to exempt from NEPA review the removal of contaminated material and equipment from Department facilities. This proposed exemption simply has no basis in fact since virtually any contamination removal project, except for the most trivial, has the potential for significant

environmental impacts and should be the subject of some level of NEPA review.

For example, the removal of large quantities of plutonium recently discovered in the ventilation ducts at the Rocky Flats Plant would be entirely exempted from NEPA review under the proposed regulations. Similarly, the removal and decontamination of radioactive equipment from the Portsmouth and Paducah uranium enrichment plants -- a project costing more than a billion dollars -- would also be exempted.

The proposed regulations would exempt a number of other actions from NEPA review including transport of a variety of wastes and materials, the construction and operation of buildings and support structures, and the renovation of a facility or replacement of components. These and other proposed exemptions, if adopted by DOE, would further erode NEPA's dual mandate -- informed agency decisionmaking and meaningful public participation. They would also fly directly in the face of Secretary Watkins' commitment that "if the Department is to err in its judgment as to [the] extent of NEPA review required of new projects, it will err on the side of full disclosure and complete assessment of potential environmental impacts."²⁹ DOE's ES&H Office must alter the approach it has taken in the proposed regulations if it is to honor this commitment.

²⁹ "Remarks by James D. Watkins, Secretary of Energy," June 27, 1989. p. 7.

ATTACHMENT A

THE NEW YORK TIMES, SUNDAY, MARCH 3, 1991

Business

Managing

Giving the Environment Teeth

The idea is to get a top official who won't put production ahead of pollution concerns.

By CLAUDIA H. DEUTSCH

LAST summer, the International Business Machines Corporation took a giant step backward — on purpose.

Years earlier, it had decentralized responsibility for environmental matters. Then, on July 1, it appointed Arthur J. Hedge Jr., a corporate officer who had run the real estate and construction departments, to the new job of vice president of environmental health and safety. It gave him a staff of roughly 30 people culled from such disparate departments as real estate, personnel, legal and energy. And it charged the new group, which is based at I.B.M.'s Armonk, N.Y., headquarters, with insuring that corporate environmental policy is carried out.

"We needed one high-level group to focus

our environmental efforts, and to send a clear signal that management cares about the environment," Mr. Hedge said.

I.B.M. is one of many companies that are upgrading the size, scope and status of their headquarters' environmental staffs. "Companies want people who can find the common thrust between technological, legal and public relations needs," said Bruce Piasocki, associate professor of environmental management at Rensselaer Polytechnic Institute in Troy, N.Y.

They also want people who won't be cowed by plant managers who are more concerned with production than pollution. "Environmental people who report to someone above the plant manager are immune to politics," said William Alford, a New York recruiter who specializes in environmental jobs.

There are many reasons this is happening now. Companies still want to push decision-making as far down the line as possible. But they also want corporate-wide pollution control programs. They want environmental monitoring mechanisms that insurance underwriters will buy into. And they want to be sure that in a weak economy, headquarters' hands-off policies are not interpreted by plant managers as a go-ahead to press for profits instead of environmental compliance — something particularly onerous at a time

of nationwide environmental activism.

"The public has upped the ante, so we've upped the environmental function's clout," said Bruce W. Karrh, the Du Pont Company's vice president of safety, health and environmental affairs. Indeed, since 1987, Du Pont has increased the number of environmental jobs at Wilmington, Del., headquarters to 11 from 3, installed a more formal environmental audit process and tightened the criteria for joining the environmental staff.

Environment has a higher profile around the Polaroid Corporation's Cambridge, Mass., headquarters, too. Four years ago, Polaroid added a senior manager in manufacturing to control generation of toxic waste, and another in research, to see that new processes are environmentally sound. A few months ago, it added a senior marketing person to see that Polaroid products and packages do not cause a solid-waste problem.

"What we are doing is incorporating environmental issues into the management system," said Harry Fatkin, Polaroid's director of health, safety and environmental affairs. Polaroid now is installing a complex auditing system that will check not only that plants are in compliance with environmental policies, but also that their management systems promote environmental and safety concerns.

When the Boss Gets Involved

SOMETIMES, one word from the chairman can be worth a thousand words from the next level down.

Just ask Bruce W. Karrh, the Du Pont Company's vice president of safety, health and environmental affairs. As a Du Pont officer, Mr. Karrh, who has run the company's environmental operations since 1984, is a honcho in his own right. Even so, plant managers often balked when he advised them to commit resources to environmental projects.

Then, in May 1989, Du Pont's chairman, Edgar S. Woolard Jr., called for "corporate environmentalism" and dubbed himself Du Pont's "chief environmentalist." All of a sudden, plant people were begging Mr. Karrh for environmental advice.

"I used to have to do a real selling job to the line people," Mr. Karrh said. "Then suddenly it wasn't just me trying to get the organization to do things, it was Ed. Now they call all the time."

Ciba-Geigy, too, is putting a visible, top-level imprimatur on environmentalism. In January, it established a "governance committee" of the board of directors, responsible for overseeing any issue that affects the company's reputation. The committee, led by Ciba's chairman, Richard Barth, is looking at environmental issues first.

"We want to insure a common understanding of our expectations throughout the company," said Joseph T. Sullivan, a senior vice president and a committee member.

AUDITING certainly is getting special attention at the Ciba-Geigy Corporation's Ardsley, N.Y., headquarters. Two years ago, Ciba-Geigy put all of its environmental auditors into a stand-alone group that reports to the chief executive.

"Just like you don't want financial auditors to audit their own bookkeeping, you don't want environmental auditors to judge their own technical decisions," said Joseph T. Sullivan, the senior vice president who oversees the group that helps the plant managers comply with environmental policies.

Apparently, the separation makes a difference. At one plant, the plant managers, the lawyers and the engineers all agreed on a particular solvent's safety. The environmental auditors disagreed — and the plant people redesigned a process to eliminate the solvent.

"They figured if the internal auditors weren't satisfied, the external auditors probably wouldn't be — and neither would the C.E.O.," Mr. Sullivan said. ■

ATTACHMENT B

STATUS

Tiger Team Visits/Assessment Reports/Action Plans
(1/18/91)

<u>FACILITY</u>	<u>VISIT DATE</u>	<u>DRAFT REPORT ISSUED</u>	<u>FINAL REPORT</u>	<u>ACTION PLAN DEADLINE</u>
West Valley	----	----	Available	No action plan
Fernald	----	----	Available	6/90 Issued
Mound	----	----	Available	8/9/90 Issued
Pantex	----	----	Available	7/13/90 Issued
Portsmouth	----	----	Available	6/90 Issued
Rocky Flats	----	9/89	Available	6/20/90 Issued
Y-12 Plant	----	----	Available	11/90 Issued
Nevada Test Site	----	3/90	Available	6/21/90 Issued
Kansas City Plant	----	3/90	Available	11/26/90 Issued
Pinellas	----	4/4/90	Available	12/4/90 Issued
SRS Non-Reactors	1/29/90	5/90	Available	8/90 Issued
Lawrence Livermore	2/26/90	5/90	Available	10/24/90 Issued
Brookhaven	4/2/90	6/90	Available	1/4/90 Issued
SANDIA (Livermore)	4/30/90	7/31/90	Available	--
Hanford	5/21/90	11/20/90	Available	4/12/91
Paducah	7/9/90	9/90	--	--
INEL	7/7/91	----	--	--
ANL-EAST	9/24/90	10/19/90	--	--
ORNL	10/22/90	1/11/91	--	--

Weapons Complex Monitor January 18, 1991

Mr. SCHEUER. Mr. Werner, as a former DOE contractor, apparently you have seen DOE from the inside as well as the outside. Could you comment on the changes you have seen in the entire complex overall and perhaps on a specific facility such as Hanford? Have you seen a change in the DOE culture, for example?

Mr. WERNER. First of all, it's quite a change stepping outside and seeing how difficult it is to get information from the inside. Overall, I think we've seen some changes, but the changes certainly in a substantive way have not nearly matched the change in rhetoric we've heard. We've heard a great deal of progressive language about the new culture within DOE. We are still anxiously awaiting that new culture to set in at DOE.

I think the site you mentioned, Hanford, offers an excellent example of the kind of changes that are now underway at the Department of Energy. Hanford only a few years ago had a significant role in nuclear warhead production within the Department of Energy. Now the Department of Energy has announced that Hanford no longer will have any kind of defense mission. The information flow from Hanford has changed and improved significantly as a result of that. We've had a lot more public meetings at Hanford. As was discussed here, we had the Hanford Environmental Dose Reconstruction Project. Hanford has an important and I think a very useful environmental research project going on with Pacific Northwest Laboratories as well.

Mr. SCHEUER. I think I have to go for a roll call vote now, so let's recess for about 10 minutes.

[Recess.]

Mr. SCHEUER. Where did we leave off?

Mr. REICHER. I've lost my colleague.

Mr. SCHEUER. Okay.

Mr. REICHER. You asked a question about Hanford of which Mr. Werner answered.

Mr. SCHEUER. Yes. All right.

Mr. Reicher, tell me, is there a need for external watchdog groups? If so, how should they be formed, what should their mission be, and how should they function?

Mr. REICHER. There is clearly a need for external agencies—

Mr. SCHEUER. Oversight surveillance.

Mr. REICHER. I think what we've seen is that the information about the problems in the weapons complex has been developed over the last several years in large part as a result of external oversight. When we relied primarily on internal oversight, we didn't get that information. So I believe very strongly that vigilant external oversight is required and it can come in many forms—first of all regulatory agencies, like EPA and State equivalents. We need to increase the resources that we provide to those agencies for oversight.

One of the big problems that we have in cleanup is that EPA and the States don't have the funding they need to ensure that cleanups are carried out effectively and efficiently.

Second, in addition to regulatory agencies, we need outside peer review by academic institutions to make sure that the scientific work that's being done inside the agency is justified and adequately carried out. And we need the ability of citizen organizations to

oversee these sorts of activities. And critical to that is the availability of information.

Mr. SCHEUER. Do you find that citizen organizations are able to aggregate the necessary professional expertise to do a credible and competent job in what is, after all, a pretty sophisticated, esoteric, application of science?

Mr. REICHER. I think in some cases citizen groups can and do have on staff people that have the capability to look at specific issues at facilities or across the complex. One example of that is my colleague, Jim Werner, who has looked very carefully for several years at the issue of cleanup priority-setting, how that's done, whether you do it based on a computer model, or whether you do it in any other form. So I think citizens groups can bring that kind of expertise, both technical and legal, to these issues. In fact, to a great extent, I think citizens groups have been instrumental in bringing problems to light, and getting them addressed in Congress, and the courts.

Critical to that, though—and I think this is important—is access to information. One of the problems that not only citizens groups have had but outside regulatory agencies have had is gaining access to information about what is going on inside.

Mr. SCHEUER. Are you talking in general about Government agencies, or specifically about DOE?

Mr. REICHER. Specifically about the Energy Department.

Mr. SCHEUER. About DOE, is this pre-Watkins new era—are you talking about the current era with its so-called new culture?

Mr. REICHER. The problem, in large part, remains. We still do not have access, and regulatory agencies do not have access, to certain information that one would need to make decisions about safety and environmental problems. For example, there are documents called probabilistic risk assessments which are used to analyze the safety of nuclear reactors. Those are regularly available with respect to commercial reactors. They are not available to the public with respect to the defense reactors. You can't ask a citizen living downwind of the Savannah River site to accept the safety of those facilities if you do not make available the most fundamental, the most critical document, which indicates whether or not the reactors can be operated safely.

Mr. SCHEUER. Congressman Sid Morrison?

Mr. MORRISON. Thank you, Mr. Chairman. I'm sorry I've missed part of this because of the interruption of the votes.

I know you've wanted to give the very highest priority to some of the concerns about environmental, safety, and health factors. What gives them a higher priority than the direct access to the Secretary of Energy? Did you remove them totally from that umbrella? We find now two different branches within the Department of Energy that do report directly to the Secretary that have these responsibilities; yet, you want to go farther than that.

Mr. WERNER. Do you have a copy of our testimony?

Mr. MORRISON. I have a question that's based on—

Mr. WERNER. Look at page 6 of the testimony—that organizational chart would be a good place to start.

Mr. MORRISON. Thank you. I looked at that earlier, and now I have no idea where I put it.

Mr. WERNER. As you see on page 6, as you mentioned, Congressman Morrison, that there are indeed now two separate offices with primary duties in the environmental area within the Department of Energy. The Environmental Restoration and Waste Management Office under Leo Duffy was added just a year or so ago to carry out—to actually manage—the cleanup. Our concern is not adding to the number of offices. It's in making sure that those offices and their lines of authority are properly aligned so that the people with the responsibility for performing the internal independent oversight—that is the Environment, Safety, and Health Office, which this Subcommittee has jurisdiction over—that they do have a direct line of access, that they do have the resources to carry out the oversight using that direct line of access to the Secretary.

Unfortunately, as we discussed in the testimony, we've seen some weakening of that oversight. Many of the technical personnel that were previously in the ES&H Office have been shifted over to the Environmental Restoration and Waste Management Office.

If you look at page 10 in the testimony, there's another chart that shows how the Environmental Restoration and Waste Management Office works. And it shows where many of those resources have been moved. Do you see the Quality Assurance/Control Office there? Many of the people who used to perform independent internal oversight in the Environment, Safety, and Health Office, have been shifted over to that Quality Assurance/Quality Control Office. The Department is saying that that has an independent internal oversight function, but, in fact that office has to report through somebody to get to the Secretary. If you're not able to report to the top boss, then you're not completely independent.

This is something, as we discussed, the private sector learned long ago. Regardless of what the regulatory agencies were doing—whether they knocked on your door or not—it's important to be out there and be proactive and try to avoid running into the kind of problems that can just fester and get more expensive as time goes on.

I think this is basically good management, and something that we can learn from the private sector. In fact, at the very end of the testimony, Mr. Morrison, there is an article from the business section of the *New York Times* about how the private sector is using this kind of management.

Mr. MORRISON. How about the new Office of Nuclear Safety?

Mr. WERNER. This is something that was added after some concerns were expressed about taking the independent nuclear safety oversight out of the ES&H Office. That has a direct line to the Secretary, as you see. That's on the page 6 table?

Mr. MORRISON. Yes.

Mr. WERNER. Steve Blush's office reports directly to Secretary Watkins. I think that provides the kind of independent internal oversight that we're talking about.

One concern that we bring up is whether that office has adequate resources to adequately carry out its function.

Mr. MORRISON. Thank you. I think that's the only question I have, Mr. Chairman, at this point.

Mr. SCHEUER. Thank you very, very much. This was an excellent panel and we're grateful to you both.

We'll now go to Panel IV and hear from the General Accounting Office representatives. Mr. Victor Rezendes, Director of Energy Issues at the U.S. Accounting Office. They've issued dozens of reports over the past few years which are critical of DOE's management of environment, safety, and health issues at its facilities. They've had an excellent track record in bird-dogging DOE.

Would you like to introduce your two guests?

Mr. REZENDES. Yes, I would like to, Mr. Chairman.

On my left is Bill Fenzel. He's our Assistant Director responsible for our work on the weapons complex. On my right is James Noel, who is responsible for doing our work in the environmental area and the cleanup of the complex work.

Mr. SCHEUER. You may please proceed for five minutes.

STATEMENT OF VICTOR S. REZENDES, DIRECTOR, ENERGY ISSUES, RESOURCES, COMMUNITY, AND ECONOMIC DEVELOPMENT DIVISION, GENERAL ACCOUNTING OFFICE; ACCOMPANIED BY: WILLIAM FENZEL, ASSISTANT DIRECTOR, WEAPONS COMPLEX, GENERAL ACCOUNTING OFFICE, WASHINGTON, D.C.; AND JAMES NOEL, ASSISTANT DIRECTOR, ENVIRONMENTAL AREA, GENERAL ACCOUNTING OFFICE, WASHINGTON, D.C.

Mr. REZENDES. I'll just take a couple of minutes to briefly summarize what we think are the main issues of why we are where we are today. It's basically a good news/bad news scenario.

First, I would like to start off by saying that DOE, in all fairness to them, has an enormous, difficult task ahead of it. It has a weapons complex that is virtually shut down today. We do not now have capability to produce nuclear warheads in the United States.

Mr. SCHEUER. Do we need such a capability?

Mr. REZENDES. Yes, we do, sir, absolutely.

In addition, virtually every one of the weapons complex facilities throughout the Country has widespread environmental contamination of all sorts.

Mr. SCHEUER. I'm curious as to why you think that we're in such urgent need of a nuclear warhead production facility. If we more or less wound down the cold war with the Russians and have a vast inventory of nuclear weapons sufficient both for us to bomb them and for them to bomb us back to the stone age, what is the urgency of producing yet even more nuclear warheads?

Mr. REZENDES. It's not so much producing more, but maintaining the stockpile that we have. One of the key ingredients within each nuclear warhead is an element called tritium. That tritium basically is the agent that gives the bomb the big bang. That's what will give you the big yield on a warhead.

The tritium decays at 5.5 percent a year. As a result, periodically the stockpile has to be returned back to the weapons complex and tritium restored, otherwise the warheads would lose most of their impact. Right now, there are only three facilities that can produce them.

Mr. SCHEUER. Maybe that's a blessing over a period of time.

Mr. REZENDES. That's more philosophical—one we were not going to get into, but we had a basic premise for operating the complex since the President and the Congress had authorized a stockpile of

nuclear warheads. To maintain that, we don't have the capability today.

For example, tritium—we have had no capability to be able to produce tritium since 1988. Those facilities have been closed down at Savannah River because of health and safety problems. These are the only three reactors in the Country that can produce that.

Mr. SCHEUER. That can produce tritium?

Mr. REZENDES. Yes, sir.

Mr. SCHEUER. Does tritium have any other earthly use for us?

Mr. REZENDES. There are some commercial uses for tritium. In fact, we sell it commercially in the United States. For example, it can be used on exit signs. It gives it the iridescent glow in the dark. There are some commercial uses, but it's a very, very small percentage. The vast majority is used in the warhead program.

Mr. SCHEUER. Okay, thanks.

Mr. REZENDES. The other point that's facing DOE that I would like to mention is that the cleaning up of the complex has to be a rather lengthy and very expensive operation. We put the price tag at over \$100 billion over the next 30 years. I think one of the things that we also have to recognize is that when we talk cleanup that in a great many situations—

Mr. SCHEUER. Is that in current dollars?

Mr. REZENDES. That's in current dollars. We think that's a conservative estimate. Our lessons on the Superfund program are that the more you know about the characteristics of a chemical, and the closer you get to cleaning those up, the cost starts to increase rather than go down.

Mr. SCHEUER. Not only the more you know, but the more highly refined your ability gets to measure. That also adds to the expense because you know a lot more about what's wrong than we did before we had this ability to measure one part of a quadrillion.

But certainly when you can measure an infinitesimal portion of one toxic substance, you find a lot of problems around the Country from misuse, negligence, and so forth.

Mr. REZENDES. That's correct.

As I mentioned, it's not only a cleanup, it's a realization that we don't have the technology today to deal with some of these issues that are out there, particularly the high level waste.

Mr. SCHEUER. You mean to clean them up?

Mr. REZENDES. To clean them up or even to fully characterize the extent of the problems that exist there. For example, at Hanford, where we have high level waste tanks, we don't have the technology to deal with them. Even if we did, one of the solutions would be to vitrify them, which is basically putting them in facilities that turn the waste into a glass substance where it would go into a repository for long-term storage. The vitrification plant is years away from operation, but even if it had been, there's no level repository to put the waste anyway, and there won't be until, at the earliest, the year 2010.

Mr. SCHEUER. Would you think then for the next 30 years, the business of our moving into—significantly moving into nuclear energy and increasing the percentage of electricity produced by nuclear, do you think that really must be deferred because of our current ability to store the toxic waste resulting from production?

Mr. REZENDES. There's no question that the lack of having a permanent high-level waste repository is probably the prominent reason as to why nuclear energy is not going to materialize in this Country in the foreseeable future.

Let me give you some shocking numbers. Right now there are 20,000 tons of high-level radioactive waste, spent fuel rods, stored in swimming pool equivalents in 110 civilian reactors throughout the United States. By the year, I believe, 2010 or 2020—that will be the end of the useful life of most of the civilian reactors, which is usually around 40 years—there will be an additional 75 tons to be disposed of. We won't have a repository for many years.

Initially, the repository was to open, I'm sure you're aware, in 1998 in Yucca Mountain, Nevada, but that has been postponed 12 years to the year 2010 at the earliest, if all goes well. We have a lot of work to do there.

Mr. SCHEUER. Thank you.

Does that complete your testimony?

Mr. REZENDES. Yes, why don't we leave it at that, and go into questions.

[The prepared statement of Mr. Rezendes follows:]

United States General Accounting Office

GAO

Testimony

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NUCLEAR WEAPONS COMPLEX

Efforts to Improve DOE's Management of the Nuclear Weapons Complex

Statement of
Victor S. Rezendes
Director, Energy Issues
Resources, Community, and Economic
Development Division

Before the
Subcommittee on Environment
Committee on Science, Space, and Technology
House of Representatives



Mr. Chairman and Members of the Subcommittee:

We are pleased to be here today to discuss the Department of Energy's (DOE) efforts to improve the management of environmental, safety, and health matters at the nuclear weapons complex. Specifically, we will discuss DOE's longstanding management problems at the complex, recent DOE initiatives to improve its management of the complex, and key management issues that could affect DOE's initiatives.

Today, the weapons complex is virtually shut down and faces serious environmental, safety, and operational problems: the deterioration of facilities; noncompliance with environmental, safety, and health standards; radioactive wastes that have been stored for decades; and contaminated groundwater and soil that need to be cleaned up. The estimated cost to address these problems is staggering--ranging up to \$155 billion.

The problems of the complex have been largely due to DOE's failure to effectively manage the nuclear weapons complex. Important management problems have included an emphasis on production over environmental and safety matters, shortcomings in DOE's oversight function, limited technical staff to carry out departmental programs and oversight functions, and the absence of specific strategic plans for addressing the modernization and environmental problems of the complex.

DOE has undertaken several initiatives designed to better deal with its problems. These initiatives include a management and oversight restructuring within DOE, issuance of strategic plans for reconfiguring the complex and cleaning up the environment at DOE sites, and efforts to make DOE contractors more accountable. Also, the Defense Nuclear Facilities Safety Board, mandated by the Congress, will provide outside, independent safety oversight.

We believe that DOE's initiatives are steps in the right direction for ensuring that the operation of DOE's nuclear facilities is safe and environmentally sound. However, the successful management of the complex will depend on DOE's commitment to ensuring that all operations are carried out safely and in an environmentally acceptable manner, close coordination and interaction among various oversight organizations and program offices, and the recruitment of technically qualified staff.

I would now like to discuss in more detail the (1) longstanding management problems at the complex, (2) DOE's initiatives to improve management, and (3) key management issues that could effect DOE's initiatives.

LONGSTANDING MANAGEMENT PROBLEMS

Throughout the last decade, our work, as well as other independent studies, has identified continuing management problems that have contributed to the seriousness of the environmental, safety, and health problems at the complex. Specifically, these problems have included DOE's emphasis on production over environmental, safety, and health matters; shortcomings in DOE's oversight; lack of technically qualified staff, resulting in an overreliance on contractors; and inadequate strategic plans for addressing the problems at the complex.

As early as 1985, we reported that DOE placed more emphasis on contractor performance in achieving production goals than on environmental, safety, and health matters. In 1989, we reported that under DOE's award fee process, DOE has awarded substantial money to some DOE contractors despite the existence of significant environmental, safety, and health problems at the facilities they managed. DOE officials have also acknowledged that in the past, production has taken priority over environmental and safety considerations.

Shortcomings in DOE's oversight program have been another important management problem. We have issued numerous reports identifying persistent problems with internal and external oversight of DOE facilities. Similarly, the Secretary of Energy,

on taking office in 1989, determined that the existing oversight system for environmental, safety, and health matters at DOE was a failure. The major cause, according to the Secretary of Energy, was confusion about the roles of DOE's headquarters program management, the agency's field organization, and the Office of Environment, Safety, and Health--the result of an absence of clear lines of authority and responsibility, dilution of accountability, and an absence of adequate specificity in DOE orders.

Lack of technically qualified staff has also limited the effectiveness of DOE's environmental, safety, and health oversight functions. Because of difficulties in recruiting and retaining personnel with the necessary expertise, DOE has had to rely extensively on the use of contractors to assist in providing assurance that DOE facilities are operated safely and in an environmentally sound manner. As studies throughout the 1980s showed, DOE has not been able to properly perform environmental and safety oversight because its staff lacked the technical capabilities and experience.

Finally, DOE has lacked comprehensive strategic plans for addressing its problems. In March 1987 we pointed out that DOE did not have an adequate plan for addressing the wide-ranging problems it faces. At that time, we called upon DOE to develop a strategic plan setting forth, among other things, a comprehensive picture of the environmental, safety, and health problems that had to be

addressed and a framework for prioritizing the billions of dollars in federal expenditures needed to address them. Such strategic plans are important for providing DOE and the Congress with a comprehensive strategy for making sound decisions to effectively manage and determine the future direction of the complex.

DOE INITIATIVES

DOE's initiatives are designed to better deal with these longstanding management problems. These initiatives include (1) a management and oversight restructuring within DOE; (2) issuance of strategic plans on environmental restoration and waste management and on reconfiguration of the complex; (3) assessments of DOE's facilities to determine whether they meet federal, state, and local environmental, safety, and health requirements; and (4) efforts to make contractors more accountable for environmental, safety, and health matters.

DOE's management and oversight restructuring initiatives are designed to instill a "management culture" throughout DOE and its contractors that focuses on correcting environmental, safety, and health problems. This restructuring has been three-fold. First, DOE has established an Office of Environmental Restoration and Waste Management to consolidate environmental cleanup, compliance, and waste management activities. The office's primary task is to carry out DOE's 5-year strategy for the cleanup up of its

facilities. This includes providing centralized management for waste management operations and environmental restoration.

Second, DOE has restructured safety functions to ensure the safe operation of its facilities. Specifically, DOE has (1) realigned DOE's existing nuclear safety oversight functions from the Office of Environment, Safety, and Health to various DOE program offices; (2) established the Office of Nuclear Safety to independently oversee nuclear safety; and (3) transferred the development of nuclear safety policy from the Office of Environment, Safety, and Health to the Office of Nuclear Energy. In addition, the Defense Nuclear Facilities Safety Board now provides outside, independent safety oversight.

Third, DOE has undertaken initiatives to restructure the Department's accountability in the area of worker health and safety. These initiatives include (1) the development of an occupational health and epidemiology program; (2) the transfer of long-term health effects studies to the Department of Health and Human Services; (3) the establishment of an advisory committee to oversee DOE's environmental, safety, and health activities; and (4) development of a comprehensive epidemiologic data repository containing information on past and present DOE workers.

In addition to its managerial restructuring, DOE has issued two strategic plans. Last year, DOE issued its Environmental

Restoration and Waste Management Five-Year Plan report, which outlines a multibillion-dollar effort over the next 5 years (fiscal years 1992 through 1996) to (1) begin bringing facilities into compliance with environmental laws, (2) begin cleaning up environmental contamination at DOE sites, and (3) manage the wide variety of radioactive and hazardous waste that DOE generates. Furthermore, DOE, in January of this year, issued the Nuclear Weapons Complex Reconfiguration Study. This study describes various options for reconfiguring the complex by 2015. It also defines broad objectives for the new complex, including consolidating various sites within the complex, privatizing nonnuclear facilities in the complex, and reducing the amount of nuclear weapons in the nuclear weapons stockpile.

DOE has also been assessing its facilities to ensure that they achieve and maintain full compliance with federal, state, and local environmental, safety, and health requirements. These "Tiger Team" assessments evaluate DOE's environmental, safety, and health programs and advise the Secretary--independent of line management--of their (1) effectiveness; (2) compliance with federal, state, and local regulations; and (3) internal DOE requirements. In addition to DOE personnel, Occupational Safety and Health Administration inspectors have participated in these assessments to provide their perspective on DOE's worker health and safety programs.

Finally, DOE has made its contractors more accountable for environmental, safety, and health matters. Specifically, DOE has implemented changes to improve its award fee process. These changes include having all awards reviewed and concurred in by DOE headquarters and requiring that environmental, safety, and health matters be weighted by at least 51 percent in the evaluation process. Furthermore, DOE has published regulations that will make its management and operating contractors liable for certain costs, claims, and liabilities that were previously reimbursed by DOE.

MANAGEMENT ISSUES

DOE's management initiatives are a positive step in addressing the longstanding management issues at the complex. However, we have identified several key issues that may affect DOE's ability to implement these initiatives. Specifically, we believe that successful management of the complex will depend on (1) DOE's commitment to ensuring that all operations are carried out safely and in an environmentally acceptable manner, (2) close coordination and interaction among various oversight organizations and program offices, and (3) the recruitment of technically qualified staff. I would like to discuss our views on each of these issues at this time.

DOE's Commitment to Environmental,
Safety, and Health Issues

Once established, we believe that DOE needs to maintain a "culture" committed to resolving environmental, safety, and health problems that confront the weapons complex. As pointed out by the National Academy of Sciences in 1987, the assurance of safety at DOE's reactors cannot be generated by organizational restructuring alone; a change in attitude toward safety will be needed as well.

The Secretary of Energy, as part of his new management focus, is attempting to increase DOE's sensitivity to environmental, safety, and health matters. However, such changes must filter down through all levels of DOE, including its contractors. Consequently, instilling the right attitude towards environmental, safety, and health matters will likely be a slow and difficult process. In this regard, DOE has taken several restructuring actions in the past, such as establishing the Assistant Secretary for Environment, Safety, and Health and an Advisory Committee on Nuclear Facility Safety to improve the management of DOE's facilities. Despite these initiatives, environmental, safety, and health problems persist. Thus, the ultimate test of DOE's recent initiatives will be determined by the extent to which DOE can develop and maintain, at all levels in the department, a "culture" committed to resolving environmental, safety, and health problems.

Coordination Among Various
Organizations and Program Offices

Effective coordination among DOE's offices and the various oversight organizations is extremely important. Past problems, such as the absence of clear lines of authority and responsibility, necessitated the recent restructuring within DOE. Effective communication will be necessary, once the responsibilities of DOE's new organizational structure are established, to ensure that all organizations within DOE clearly understand their responsibilities. Once this is accomplished, DOE will be in a better position to effectively carry out recent initiatives to improve its management.

Since DOE's managerial restructuring is still undergoing change and will entail several functional and staff moves over a period of time, it is important that the various internal and external oversight organizations coordinate and interact closely. Close coordination and interaction should help to minimize inefficiencies and maximize oversight effectiveness, especially during the transition period. For example, the transition period provides DOE with the opportunity to establish an early positive working relationship with the congressionally mandated Defense Nuclear Facilities Safety Board.

Recruitment of Technically Qualified Staff

Sufficient technical staff will be needed to effectively carry out DOE's recent initiatives. However, as pointed out earlier, DOE has had a shortage of technical staff. Furthermore, competing demands for them may hinder DOE's recruiting efforts. The competition comes not just from private industry working in these areas, but also from other organizations within the federal government as well as offices within DOE. For example, DOE will have to compete with the Defense Nuclear Facilities Safety Board for the same technically qualified personnel that will be needed for the Board to carry out its safety oversight function. As well, DOE will have to compete for environmentally qualified staff with the federal, state, and private industry groups responsible for cleaning up waste sites.

If DOE is unable to recruit the required technically qualified staff, it may have to rely heavily on its contractors, as in the past, to ensure that DOE operations are carried out in a safe and environmentally acceptable manner. Consequently, the organizational restructuring may not, in itself, ensure the effective management and oversight that DOE's renewed emphasis on environmental, safety, and health issues will require.

SUMMARY

In summary, the environmental, safety, and health problems facing the nuclear weapons complex are still critical. To its credit, DOE has undertaken several initiatives that will enable it to more effectively deal with its problems. Although these initiatives, in themselves, do not remedy the problems facing the complex, they are an important aspect of creating an organization and management system capable of effectively planning, implementing, and overseeing corrective actions. Rebuilding and cleaning up the complex is a long-term, costly undertaking, and the pace, timing, and resources devoted to this undertaking are fraught with uncertainties because of the huge budget deficit and other competing demands.

DOE's initiatives are moving in the right direction. However, DOE needs to be continually aware of the issues raised in this testimony--a commitment to environmental, safety, and health matters at all levels; effective coordination among various oversight organizations and program offices; and recruitment of the necessary technical expertise. How effectively DOE addresses these issues will affect the effectiveness of DOE's initiatives to better organize itself. For our part, because of the importance of ensuring that the nuclear weapons complex is safe and operated in an environmentally sound manner, we will continue to monitor DOE's

progress in implementing these initiatives and assess any future initiatives.

- - - -

Thank you. That concludes my testimony. We would be happy to answer any questions.

(301976)

Mr. SCHEUER. All right.
Congressman Sid Morrison?

Mr. MORRISON. Thank you, Mr. Chairman.

Just in response to your last point, I would be remiss to ask, is the storage of high-level nuclear waste a technical problem or a political problem?

Mr. REZENDES. It's a political problem. There's no question.

Mr. SCHEUER. Let me just put a footnote in there.

Mr. REZENDES. Sure.

Mr. SCHEUER. If we had a technically sound method of disposing of nuclear waste, that would be credible and attested to by scientific experts that would be non-health threatening, then would it still be a political problem, or could we convince the public if we had credible evidence from sound scientific groups?

Mr. REZENDES. I think you're both putting the finger right on the key issue, the lack of credibility with the American public that we can develop a sound way to deal with nuclear waste.

Mr. SCHEUER. Before you develop the sound way of doing it, there's no point in worrying about the political problem.

Mr. MORRISON. I represent an area that was a candidate site for that storage. We're very comfortable with it, particularly the glassification process.

This is a little off the subject of the hearing, but in fact, we feel relatively confident that maybe this is a blessing in disguise. There are a lot of very valuable things in what we now term "nuclear waste." Our kids are going to figure out how to separate them and use them to cure diseases and a host of other things. I'm sorry to see the waste issue used as a way of slowing the development of the cleanest energy forms that we have.

I want to get back, perhaps, to the issue directly involved in the oversight hearing. You mentioned that we don't have the technology on cleaning up a number of these sites, and I would really totally concur with that. Have you looked at the Department's plan, perhaps you were here for my questioning of the witnesses earlier from the Department of Energy when we discussed the Environmental Molecular Science Laboratory. Do you folks at GAO concur with this concept that maybe we have to go back to some very basic and fundamental science in order to find the answer on best dealing with the difficulties—the technology of cleaning up a number of these sites that we have accumulated over the last 40 years or so?

Mr. REZENDES. Obviously technology is not our area of expertise. We have looked at some aspects of the cleanup and what kind of available technologies are out there, but really our forte is actually management.

What we see is that while there are a lot of technology-related problems in dealing with high-level waste—for example, the Hanford tanks—some of it is basically management—management of contractors overseeing the systems that are in place to cleanup. We think those are as important, if not more important, than some of the technology issues that are out there.

Mr. MORRISON. I guess my frustration is that DOE is proceeding with some plans for developing the technology thinking that they're finding the answers to that. I guess what I fear most is, at

some point, a GAO audit saying, "You folks are doing this wrong." We don't want to get caught in that trap. I'd rather have your guidance as we proceed.

Let me ask a similar question in a slightly different way. Do you sense, as you look at the management issues in dealing with the environmental safety, health, the cleanup of our defense complex, that the Department is moving in the right direction to establish a framework in which the job can properly be done?

Mr. REZENDES. Yes. In fact, we want to give them high marks for moving in the right direction. We think the reorganization is good, we think some of the things they have done are certainly going the right way. But we think the Department suffers from some of the same difficulties that brought us to where we are today, basically a lack of the quantity and quality of expertise internally to manage its contractors and again an over-reliance on contractors to do the Department's work.

We need to take a hard look at how DOE does that. Do we want to rely on contractors? Do we have the expertise internally in DOE to know and to oversee the contractor's work? We have some reservations that we do.

Mr. MORRISON. Of course, they're trying to expand the base of contractors from which they work. I guess I know my own area best of all in which general operation by Westinghouse Corporation—that cleanup is not their area of expertise. So, the Department of Energy seems to be opening up to some outside contractors who in fact do have the technical base for—

Mr. REZENDES. But that raises another interesting issue, another area we're concerned about, not only the lack of expertise internally within DOE, but take a look at what's happening nationwide. We estimate \$100 billion to cleanup the nuclear weapons complex within the next 30 years. You add, for example, the cleanup that's going on in the Environment Restoration Accounts at the Department of Defense, you have the Sperrfund cleanup that's going on, you have the remedial corrective provisions of RCRA which is basically being done by private industry. It's easy to come up with mind-numbing numbers of anywhere from \$250 billion to \$500 billion. Between now and over the next 20 or 30 years, you can raise serious questions as to whether we have that infrastructure in that cleanup industry to respond to that kind of volume of work.

Mr. NOEL. I think one other thing here, too, that's relevant is the proposal that you're referring to to replace the M&O contractor at Hanford with the so-called Environmental Restoration Management Contractor, or ERMIC.

I think it addresses what is for a lot of people kind of a gut level problem which is: Why should we pay the same guys that made the mess to clean it up? And do they really have the expertise to do that?

Our concern is more that—a contractor, in some sense, is a contractor and they still need to be overseen properly. They still need to have their activities watched to make sure that they're doing what the Department and the public needs to have done. Without some changes within the Department, you could take out one sign and put in another but still have some of the same management problems that you had all along.

Mr. MORRISON. Obviously, this is a learning process as we go along.

Mr. NOEL. I think for all of us.

Mr. MORRISON. One last question. The Chairman was a little perplexed when one of the answers said that our priorities are compliance-driven. From a management point of view, is it sound practice to just meet the tests of existing safety requirements that might be on the book somewhere—or they mentioned milestones, which would be agreements with State agencies, as in the Tripartite Agreement out our way? Is that the soundest management plan for proceedings with really doing the job for taxpayers on this cleanup process?

Mr. REZENDES. I think OTA and GAO are in pretty good agreement on this one. There is a need for some kind of risk-based priority system, a system in place to know that you're dealing with the most critical life-threatening problems first.

As I mentioned earlier in this discussion, I think it's also a sense of realism. It's a sense of full disclosure to the American public. Yet in some of these cases, we are not going to clean them up either because it's too costly, we don't have the technology, or even if we did, we wouldn't have any place to put it.

Mr. SCHEUER. But won't the public be outraged?

Mr. REZENDES. I believe they will, sir.

Mr. SCHEUER. Any one of these little communities—if they find out we can't cleanup their community, they're going to go into orbit.

Mr. MORRISON. To me, Mr. Chairman, the key to that is this risk assessment.

Mr. REZENDES. I agree.

Mr. MORRISON. We've been doing things for a lot of years in this Country that we really didn't know about. You just mentioned the ability to measure. I sometimes say that America is suffering from "microchemophobia" just with this ability to measure. We've seen some examples of nutritional terrorism as it relates to agricultural chemicals.

So, I really think that our kids are going to be a lot smarter than we are, I hope, and that we will figure what is important, what truly is a risk. Some of these things that we now might look at in horror because we can't put them in any sort of frame of reference, perhaps will be acceptable in future years because we know that won't hurt us. Right now, we don't know, so we fear them. I hope that's the case.

Mr. REZENDES. And we share that concern. We share that concern that there not be a hysteria to cleanup places that we should not be cleaning up with contractors that aren't qualified to do it.

Mr. SCHEUER. Is it a question of those contractors not really accomplishing very much that's useful, or is it a question of them making a bad situation even worse?

Mr. REZENDES. Well, that could happen also. It's difficult—I couldn't tell you what percentage of the cleanup will result in that, but I am sure that 3 years from now we could convene another panel and come up with horror stories to show that.

Mr. SCHEUER. Well, you watch your cholesterol, and we'll all be together in 3 years.

[Laughter.]

Mr. MORRISON. Mr. Chairman, I have no further questions. I just want to compliment you. You are scratching the surface of what has been an issue that has not been properly addressed from a Congressional point of view for some period of time. So, my personal thanks to the people you have invited, and thanks to the staff for putting the pieces together.

Mr. SCHEUER. One last question. We understand that ES&H is having trouble attracting and retaining competent qualified staff. Before very long, when I have to get a hold of somebody who is really professional and qualified, they disappeared to other groups, especially Environmental Restoration and Waste Management.

What could the DOE do to improve their ability to attract and retain competent scientifically qualified staff?

Mr. REZENDES. Unfortunately, Mr. Chairman, it's not a problem that is singularly to the Department of Energy. As GAO testified before, I think the Federal pay scales are a problem. I think we need to take a look at that. We have seen, for example, some exemptions to that on the Nuclear Regulatory Defense Safety Board, we've seen the NRC, we've seen some successes there.

Mr. SCHEUER. I think in HHS they have as well.

Mr. REZENDES. I think so, yes.

Mr. SCHEUER. there are no problems specific and unique to the DOE that seem to cripple their ability to hold down—

Mr. REZENDES. That is what my comment was earlier in dealing with the industry, the fledgling industry that's out there dealing with these cleanups, not only at DOE but throughout the entire Country, contractors can afford to pay more and when you have a limited universe of qualified people, the bidding price goes up. It's a question of whether we're going to pay comparable salaries in the Federal Government to compete effectively, or we're going to end up paying the contractors either way. We're going to pay these salaries whether we pay them through a contractor with a management fee, or whether we get them on board at DOE and do it ourselves.

Mr. SCHEUER. If as a society we were to go the contractor route—pay a management fee and pay the same scientist what we would have to pay him anyway—are we going to get a better design, better supervised operation than we would get if DOE hired those scientists at more or less the same salaries anyway but didn't have the management intervening either to harness their abilities, focus their abilities, or to screw up the works?

Mr. REZENDES. That's an interesting question. In our testimony we walk you through the history of the weapons complex and how we got to where we are today. We think one of the key reasons we got to where we are is because DOE, from the Manhattan project, decided that the best way to do business was to contract with the least interference to a contractor. The notion was that you would pay a little more, but it would be efficient and more effective than if the Federal Government did it themselves.

Here we are 40 years later, and we have a weapons complex that is virtually shut down, it's going to cost the American taxpayers \$150 billion to clean it up and modernize it over the next 20 or 30 years. We were hoping that we would learn a lesson from that and

not make the mistake in cleaning up the complex with the same folks that got us here today.

Mr. SCHEUER. Mr. Morrison?

Mr. MORRISON. Mr. Chairman, you've been very gracious in your time. I could ask more questions at this point, but I think it's better that we conclude this hearing.

Mr. SCHEUER. Thank you very, very much. This has been a very interesting hearing. You have been very helpful. I'm sure we'll be back to you. This isn't the beginning of the end. I'm not sure it's even the end of the beginning. I look forward to working with all three of you in the years to come.

[Whereupon, at 4:15 p.m., the subcommittee adjourned, to reconvene at the call of the chair.]

APPENDIX I

PHYSICIANS
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Editor, PSR Quarterly

Maurice T. Thornton

Executive Director and

General Counsel

April 16, 1991

The Honorable James H. Scheuer
Chairman, Subcommittee on Natural Resources,
Agriculture Research and Environment
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

On behalf of Physicians for Social Responsibility (PSR), I wish to submit supplementary materials for your hearing record on the Department of Energy's health and safety programs. For several years, PSR has been working with a group of distinguished physicians, epidemiologists, physicists, and occupational and environmental medicine specialists to review these programs and make recommendations for changes.

Our Physicians Task Force on the Health Risks of Nuclear Weapons Production worked extensively with the Secretarial Panel for the Evaluation of Epidemiologic Research Activity (SPEERA), testified before that panel at each of its public meetings and commented upon its final recommendations and Secretary Watkins' initiatives for implementation. We wish to summarize our views on these issues for the record and for the consideration of the subcommittee as your deliberations continue.

The problems at our nation's nuclear weapons production facilities have convinced us of the need for major statutory changes in the responsibilities assigned to the Department of Energy and the laws that govern operations within the nuclear weapons production complex.

We believe these programs have suffered from inadequate resources for far too long, a finding reinforced by the "observations" and "principles" articulated in the SPEERA panel's report, and in testimony you received last year from the panel's chair, Kristine Gebbie.



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The Office of Technology Assessment's (OTA) February 1991 report, Complex Cleanup, presents an even deeper indictment of DOE's priorities, and confirms what we have been saying for years about the root causes of DOE's problems with health and safety. OTA reported that the DOE does not have the capacity to reliably inform itself about health and safety aspects of its operations, including weapons facilities cleanup and production. The OTA found that DOE did not have the infrastructure to make health-based decisions or any interest in obtaining that capability through an aggressive research program.

We believe that DOE's health programs suffer from a serious and fundamental weakness -- an inherent conflict of interest with DOE's mission to research, test and manufacture nuclear weapons. The proceedings of the SPEERA established, in one place, a public record of the Department's epidemiology program and the effects of this conflict. The OTA's report confirmed our conclusion that DOE's research activities do not enjoy public credibility. The testimony to SPEERA from current and former DOE researchers reveals why: a culture of secrecy and institutional barriers to inquisitive science produced incomplete and highly-suspect results.

Reorganization of the DOE's programs related to worker and public health should strive to achieve several important goals:

- * eliminate the current conflict of interest between health protection and weapons production.
- * eliminate the culture of secrecy surrounding scientific research into health hazards around DOE nuclear weapons facilities.
- * establish public credibility in the results of epidemiologic research and in programs to protect worker and public health and safety.

DOE's health research programs clearly need strengthening and independence. To protect the long-term health of weapons facilities workers and the surrounding public, we believe it is essential to transfer epidemiologic research and associated data on the health effects of low-level ionizing radiation from DOE to an independent, better-qualified health agency like the Department of Health and Human Services. It is crucial to insulate epidemiologic researchers and program managers, as well as worker health and safety oversight officials, from weapons production pressures that can influence the study of health and environmental impacts from DOE activities.

The OTA explicitly recommended that Congress "establish a new office to direct and coordinate Federal risk assessments, health assessments, Stat-organized health studies, and does reconstruction projects" [Complex Cleanup, pp. 135-139].

The SPEERA panel endorsed the same type of shift, though less

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explicitly, to bring broader expertise to research efforts, help establish greater scientific objectivity in the research, facilitate greater openness, improve credibility and ensure that possible weapons production health risks are more comprehensively examined than at present.

But it is critical that such a shift be a permanent and statutory transfer of authority from DOE to HHS. A Memorandum of Understanding (MoU) is not an effective or reliable method of assuring that DOE conflict-of-interest is eliminated.

- * On March 12, 1990, Dr. James Mason, Assistant Secretary for HHS, told the SPEERA panel that MoU's require close cooperation and coordination between Department Secretaries and their undersecretaries and staff. Epidemiologic research into DOE weapons production will have to continue for many years and continuing close cooperation between DOE and HHS will be required indefinitely. But the MoU negotiated by current Secretaries does not assure consistent cooperation in the future after personnel and policy changes at the two agencies. Consistent standards, accountability, openness, and adequate resources are best guaranteed through clear statutory assignment of authority to HHS.
- * MoU negotiations are long and tedious processes even on simple issues between well-intentioned Secretaries. DOE and HHS took over eight months to complete and sign their MoU, and there is little evidence that significant work has taken place since the MoU was signed. The MoU implementation panel met for the first time in February. It is clear that the MoU mechanism has already delayed significantly any expanded "extramural" research effort.
- * SPEERA heard from many witnesses, including Dr. John E. Till, Chairman of the Technical Steering Panel for the Hanford Environmental Dose Reconstruction Project, about the importance of restoring public credibility in epidemiologic research around DOE facilities. They noted that through an MoU, executive branch agencies, and DOE in particular, will still shape the "extramural" research program at HHS. This continuing DOE influence will be perceived as a continuation of closed-door policies and the "culture of secrecy" that have tainted DOE-contracted research.
- * The DOE-HHS MoU does not shift responsibility for key, "long-term, analytic" research activities -- many of those will still be conducted by DOE with the same resource, management and credibility problems. DOE also remains responsible for data collection and dissemination, through a proposed Comprehensive Epidemiologic Data Resource (CEDR). But the program to create CEDR is dead in the water, after DOE rejected a proposal that could have provided broad access to independent researchers.

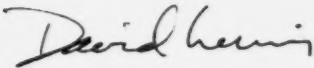
- 4 -

- * Under the MoU, DOE also remains responsible for the "short-term, descriptive" occupational health surveillance studies of DOE workers. Despite SPEERA's specific recommendations to do so, DOE has not made progress toward developing a standardized, comprehensive surveillance system.

In summary, the MoU is temporary and insufficient, allowing DOE to remain in control of research and to delay independent access to data. The only appropriate solution is to take DOE out of the health research business, and give statutory authority to an agency that can complete this work credibly and swiftly.

We look forward to working with you on these and other legislative proposals to resolve current deficiencies in the DOE's epidemiology programs, promote better understanding of the health risks of nuclear weapons production, and facilitate protection of the public health from existing and ongoing environmental threats.

Sincerely,



David Lewis
Executive Director

enc.



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PERSPECTIVE

guest editorial

HEALTH EFFECTS RESEARCH STILL UNDER ENERGY'S LONG SHADOW

by Daryl Kimball, Associate Director for Policy,
Physicians for Social Responsibility, Washington,
D.C.

Among the hundreds of thousands of workers and citizens living in the shadow of the country's 17 major nuclear weapons facilities, distrust of the Department of Energy's methods and motivation is deepening. New and alarming disclosures about unsafe reactors, toxic and radioactive emissions, plutonium fires, and leaking, potentially explosive waste tanks have led the public and the Congress to severely question DOE's consistent claims that radioactive and toxic contamination from weapons production pose no imminent health risk. In the summer of 1990, the shocking news of DOE's deliberate and massive release of radionuclides from the Hanford Nuclear Reservation in the 1940s — without informing the public — sent DOE's credibility to an all-time low.

The secrecy surrounding bomb production and the historic disregard for the associated environmental and public health impacts is due to a fundamental conflict of interest within the DOE. For nearly 50 years, the DOE and its predecessor agencies have produced nuclear weapons and maintained sole authority for epidemiologic research on the health effects of those operations. Time and again the health and safety of DOE's workers and the public have lost out in that conflict and information on health effects has remained behind closed doors in the name of "national security."

To his credit, in 1989, incoming Energy Secretary James Watkins realized he must respond to the public's growing doubts and allow greater outside scrutiny of the Department's health protection and research programs. Watkins also sought to take the initiative before Congress did, with legislation to "take DOE out of the health business," by transferring radiation health research to an agency independent of DOE.

In late 1989, Watkins appointed a special advisory group, the Secretarial Panel for the Evaluation of Epidemiologic Research Activities (SPEERA), to recommend changes in DOE's health research program. The recently completed DOE-HHS (Health & Human Services), "Memorandum of Understanding" (MOU) to transfer long-term, analytic epidemiology from DOE to HHS represents Watkins' most significant attempt to implement the panel's recommendations and reform DOE's health research activities.

But does the MOU fully address the issues raised through the course of SPEERA's public hearings? Will the MOU lead to meaningful investigations on the extent and nature of the environmental and health effects of nuclear weapons production activities — investigations that will help past victims of the nuclear age and prevent adverse health effects from nuclear weapons production and "cleanup" in the future? Or will it continue to leave vital health and safety concerns in the dark?

The growing consensus among concerned citizens, independent scientists, public health experts, and Congressional observers is that the MOU cannot alone begin to address the fundamental problems of DOE's epidemiologic research programs. The transfer of a sub-set of health studies is in and of itself positive — but mere tinkering is not enough. Without further, more comprehensive reform, it may allow the DOE to maintain its monopoly over radiation and nuclear weapons production health effects research.

The MOU essentially gives HHS researchers authority and funding to conduct the DOE's current, long-term worker and community health studies. This only adds up to \$17 million in research for the entire nuclear weapons production complex.

However, the MOU also allows DOE to maintain its responsibility for "short-term" occupational health surveillance of its

PERSPECTIVE

on

MOU
Memorandum of Understanding

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SHADOW

(from page 3)

contracted workforce, thereby failing to eliminate the conflict of interest issue and failing to restore public confidence in the results of these particular studies.

Another fundamental weakness of the DOE-HHS agreement is that it allows the DOE to remain in charge of data collection and dissemination. As Hanford-area residents know from the Environmental Dose Reconstruction Project, unfettered access to DOE health and environmental records is essential for accurate and credible epidemiology and risk assessment.

Under the MOU, HHS researchers will depend on DOE's proposed system for data dissemination, the Comprehensive Epidemiologic Data Resource (CEDR). Unfortunately, the DOE's current plans for CEDR would not include all the available health and environmental data. Data sets for some DOE facilities and data pertaining to key health variables could be left out of CEDR altogether. Furthermore, the enormous cost and technical obstacles of CEDR cast doubt on whether DOE will ever complete this elemental function of future health research. Now, nearly two years after its inception, CEDR is underbudgeted, behind schedule, and fraught with technical problems.

The MOU does not resolve the issue of who is responsible for risk assessments and epidemiologic studies on the health effects of nuclear weapons production. Confusion and uncertainty exist over who will initiate and carry out future studies. The HHS research agenda and its capabilities are limited by the DOE's annual funding requests. And it is clear that DOE will be unable to assemble an "in-house" capacity to carry out such studies. DOE's proposed Office of Epidemiology and Health Surveillance would occupy a relatively low



Jim Borgman. Printed by permission

position within the bureaucracy—a sign that health effects investigations are still a low priority in the Department. Important health objectives are likely to slip through the cracks because there is no one agency or coordinating body responsible for this work.

Future DOE or HHS Secretaries could significantly alter the MOU without approval from Congress because it is not permanent or statutory. Without Congressional legislation, the execution of the MOU will depend on the goodwill and cooperation of the DOE health officials who came from the Department's self-avowed "culture of secrecy."

BEYOND THE MOU

At best, the MOU sets a precedent for greater public involvement and independent research which may lead to more comprehensive reform. The MOU represents a radical change in what was considered permissible by the DOE only two years ago. Secretary Watkins initially rejected the proposal

by Physicians for Social Responsibility and Congressional critics, including Senator Tim Wirth (D-CO) and Representative Ron Wyden (D-OR), to give an independent health agency statutory authority to conduct nuclear weapons production health effects studies. It is also an example of the power of concerned citizens asking hard questions and demanding straight answers. But the need for public involvement and input is not nearly over.

For DOE, HHS, and other federal agencies, the task of actually implementing the MOU lies ahead. It is up to citizens and workers affected by these plants to voice their concerns about the failures

of the MOU and to urge their Congressional representatives to introduce legislation that makes the transfer of health effects assessments permanent and more comprehensive. Now that the MOU grants independent researchers at CDC responsibility for community health studies, citizens should also ask their state health officials how the CDC can be called on to assist with state efforts to conduct dose assessments, health surveillance programs, and epidemiology studies. And perhaps most importantly, citizens groups must continue to demand accountability by monitoring and becoming a part of the site-specific health research advisory panels mandated by the MOU.

What is at stake is much more than a federal agency's credibility. The health, and indeed the lives, of many Americans may be at risk if we do not demand a well-funded, coordinated, independent effort to understand and address the health risks of past and current nuclear weapons production. It is all the more essential now to drag answers out of the darkness, as the DOE begins to decide how sites such as Hanford, Savannah River, INEL, and Rocky Flats will be cleaned up.

D.K.

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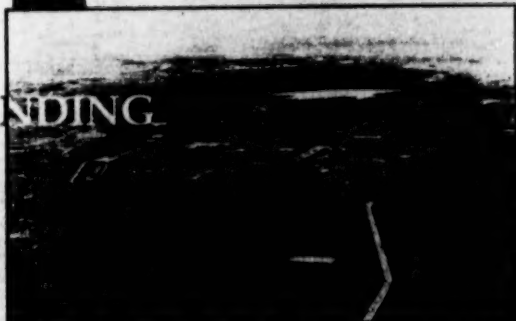
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UNDERSTANDING THE MOU

by Tim Connor



Rocky Flats - Photo by Robert Del Tredici, printed by permission of Harper & Row. Rocky Flats employs 6,000 people. It is 16 miles upwind from Denver and a half mile from the Great Western Reservoir, double above the plant. The reservoir serves the nearby town of Breckenridge (pop. 36,000).

Faced with mounting public criticism and growing support in Congress for sweeping reforms in the nation's radiation research program, Energy Secretary James Watkins has agreed to relinquish his agency's control over a considerable chunk of federally-funded radiation health studies. The decision by Watkins allows the transfer of several health studies—including community health investigations such as the study of off-site radiation doses near Hanford—from the Department of Energy (DOE) to the Department of Health and Human Services (HHS).

The action, which took the form of a Memorandum of Understanding (MOU) between Watkins and Secretary of Health and Human Services Louis Sullivan, does not commission any new studies *per se*. Rather, the agreement is an effort to open federal radiation research to investigation beyond the ranks of DOE's traditional contract laboratories, and to increase the independence and openness with which future studies are commissioned and carried out.

The agreement between Watkins and Sullivan culminated a relatively 16-month effort by the Energy Secretary to respond to citizen pressure, criticisms from scientists, and almost weekly national press coverage of DOE mistakes and mismanagement. In August, 1989, support for wholesale reform legislation sponsored by Colorado Senator Tim Wirth and Oregon Representative Ron Wyden seemed to be eroding.

Watkins asked Congress to delay action until he received the results of an independent review of DOE's radiation research program. The Secretarial Panel for the Evaluation of Epidemiologic Research Activities (SPEERA), headed by Kristine Gable, now the health director for Washington state, was appointed to conduct this review.

Although the panel did not specifically investigate allegations that DOE-funded researchers endorsed reprisals when their findings differed with DOE's official views on the dangers of low-level radiation, it did document several substantial criticisms of the way the DOE program was being managed. In its final report the SPEERA recommended that the "analytic" function of radiation research—that of interpreting epidemiologic data

gathered on DOE workers and others exposed to radiation—be transferred to HHS and implemented through the Federal Centers for Disease Control (CDC).

"To achieve credibility," the panel noted in its March, 1990, report to Watkins, "epidemiology must be part of an institutional framework that is itself credible."

MEMORANDUM OF UNDERSTANDING

The memorandum, which was released in January, 1991, establishes new procedures for the management of federal research on the health effects of radiation and other toxic materials (e.g., beryllium) that workers and the public may be exposed to as a result of DOE nuclear operations.

Under the MOU, DOE will still have primary responsibility for gathering the radiation exposure and environmental data. But researchers commissioned by HHS/CDC (with input from an independent advisory panel) will be responsible for epidemiologic studies based on this data. This is especially important for worker studies at DOE facilities where occupational exposures over long periods of time have been recorded—allowing researchers a valuable opportunity to analyze worker health experiences.

Another important feature of the MOU is that it transfers to HHS the responsibility for conducting research on populations surrounding DOE facilities. Thus, the Hanford Dose Reconstruction project will be transferred from DOE to HHS/CDC. This transfer also opens the door for HHS/CDC to commission independent dose reconstruction studies at other major DOE facilities such as the Savannah River Plant (SRP) in South Carolina, the Idaho National Engineering Laboratory (INEL), the Oak Ridge facility in Tennessee, and the Rocky Flats Plant in Colorado.

POTENTIAL SHORTCOMINGS

Prior to signing the MOU, DOE had agreed to fund state-directed health studies around INEL and Rocky Flats. Then in January, DOE and the State of Tennessee announced they had reached an agreement for DOE to fund a state-supervised health study around the historic Oak Ridge facility.

As the Hanford dose study has shown, the technical expertise needed to do quality dose reconstruction could easily overwhelm the ability of state health departments to commission and oversee them. The problem is

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FOCUS

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that conducting health research without a meaningful understanding of the types of radioactive chemicals released, their environmental transport, and biological accumulation, can result both in wasted resources and highly misleading conclusions.

While it remains to be seen how the new agreement between DOE and HHS will affect federal participation in the state-directed studies, it is not too early to be concerned that failures in coordination or outright bureaucratic turf-battles could severely compromise the quality of these studies.

As for SRP — the largest remaining DOE production facility — the Energy Research Foundation, a Columbia, SC, based watchdog group, has formally petitioned CDC to examine radiation releases from the site over its more than 15 year history. A decision on such a study, as well as other future studies, will await the establishment of an independent

advisory panel to help HHS carry out its new responsibilities.

Obviously, the MOU will require close cooperation between DOE, DOE contractors, HHS officials and HHS-contracted researchers. The MOU outlines the protocols for this cooperation and the terms by which analytical research under existing DOE contracts will be transferred to HHS.

Still, there are ample early warning signs. Despite Secretary Watkins' public acceptance of the SPEERA recommendations and expressed willingness to implement them, negotiations between DOE and HHS took nine months before the MOU was ready to sign. During that time, at least two DOE operations offices are reported to have been in active negotiations aimed at commissioning the very sort of epidemiologic studies DOE was supposed to be transferring to HHS. Furthermore, HHS and DOE rejected an appeal by Energy Research Foundation, the Hanford Education Action League, and other citizen organizations to make a draft of the memorandum available

for public comment before it was signed.

Another concern of critics is that under the new agreement, DOE retains a great deal of control over what the SPEERA panel labeled "descriptive" epidemiologic research. Translation: DOE gets to manage the information related to radiation exposure and health experience of its workers.

Physicians for Social Responsibility (PSR), which deserves much of the credit for bringing the considerable pressure to bear on DOE that forced the first real steps toward reform, has strongly expressed its fear that DOE could use its control over the voluminous worker data to thwart the efforts of CDC-contracted epidemiologists. Another PSR warning worth heeding: the MOU itself does not enjoy a statutory foundation and could be unilaterally erased by a future Administration, turning the entire program back, once again, to the Energy Department.

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A TANGLED WEB:

The Government's Role in
Studying the Health Impacts
of Hanford

by Jim Thomas



DuPont
Building
on
Savannah
River
Plant.
Photo by
Robert Del
Prete.
Printed by
permalink.
Savannah
River
plant
employs
11,000
people and
is located
in Aiken
County,
South
Carolina

With the number of certain health-related projects from the Energy Department to the Centers for Disease Control, it is important to understand the other governmental agencies involved with determining public health effects from the operations of our country's nuclear weapons facilities. The DOE and CDC are not now able to fulfill all the needs of concerned citizens regarding Hanford's past radiation releases. There is one agency, ATSDR, which at least holds the promise of fulfilling them.

FEDERAL COMMITMENT

Agency for Toxic Substances and Disease Registry (ATSDR)

The Agency for Toxic Substances and Disease Registry (ATSDR) has a major role to play in assessing health impacts from past as well as current contamination. Unfortunately, this small agency is poorly organized, hampered in part by legislative restrictions, underfunded and understaffed. The recent report on the cleanup of the DOE weapons complex by the Congressional Office of Technology Assessment (OTA) provides an excellent report on this oft-neglected agency.

ATSDR was established by CERCLA (the Superfund law) in 1980 and began operating in 1986. It is "designed to be one of the Nation's principal agencies for the study of human health effects resulting from exposure to environmental contamination."¹ Its top administrator is the director of the Centers for Disease Control (CDC) but it receives its funding through the Environmental Protection Agency (EPA).

Even though its mandate includes listening to public concerns, ATSDR has quietly completed four health assessments on Hanford's four Superfund sites. By law the agency is required to complete the health assessments within one year after a facility has been identified as a Superfund site. With this time constraint and limited resources, ATSDR was unable to fulfill its charge of incorporating the concerns of nearby residents into the Hanford health assessments. ATSDR does plan to continue to work on updating the health assessments as more information is uncovered by the investigations connected with the cleanup effort. Clearly, concerned members of the public need to apply pressure on ATSDR.

In addition to its requirement to develop health assessments at each of the Superfund sites, ATSDR is able to perform health consultations. These are not as complex or detailed as the assessments. The

consultation is designed to quickly address particular problems, such as possibly studying the health impacts of continued liquid waste discharges to the soil. The agency needs to be asked by another governmental agency or Congress to perform a consultation. ATSDR will then investigate the problem and write a report.

After more than a year of negotiations, a Memorandum of Understanding (MOU) was signed by the Department of Energy and ATSDR, effective October 10, 1990. The signing of this MOU placed all ATSDR activities concerning Hanford and the other nuclear weapons sites on hold until the agency completes negotiations with DOE's field offices on separate interagency agreements (IA). IAs are detailed plans of how two or more government agencies will interact on a common project. The Tri-Party Hanford cleanup plan between DOE, EPA, and Washington State is an example of an IA. Officials with ATSDR in Atlanta said HEAL that they hoped to have the Hanford IA signed by mid-April. Once the IA is signed, ATSDR would like to send a site evaluation team to Hanford. Its task would be to listen to community concerns and investigate possible health and environmental problems.

The ATSDR/DOE MOU relies heavily on the HHS/DOE MOU, which is the main focus of this issue of *Perspectives*. One troubling point brought out in the OTA report regarding the interaction

between the two MOUs is that the provisions of the HHS Advisory Committee may limit ATSDR's otherwise broad autonomy regarding the conduct of health studies. The wording of the ATSDR/DOE MOU apparently requires ATSDR to submit any plans for health studies to the HHS Advisory Committee for approval prior to the initiation of such studies.

Even when ATSDR signs the IA with the Richland (DOE) field office, concerned members of the public should not expect any kind of quick action. Although ATSDR has a broad scope and numerous responsibilities, it is seriously underfunded and understaffed to deal with the many problems and associated health threats posed by the DOE's nuclear weapons complex. The agency has only two health physicians for the entire country.² It is also primarily dependent upon DOE for the funding of its health studies connected with the nuclear bomb plants.

Some downwinders have expressed the need to set up a comprehensive disease registry. As its name implies, ATSDR also has the authority to investigate and, if feasible, set up a disease registry. However, these registries are expensive and offer only long-term assistance to medical researchers. Greg Thomas of ATSDR's office in Seattle said that there has not been a lot of discussion concerning disease registries at Hanford.³

On the positive side, ATSDR has not made any lessions as to what kind of additional health studies might be needed around Hanford. With this open playing field and the broad mandate given to ATSDR, Hanford does not wonder and other concerned citizens should expect a serious dialogue with the agency to answer some of the questions that fall outside the scope of the dose reconstruction and thyroid disease studies. Because the CDC/DOE MOU has given such broad authority to the HHS Advisory Committee concerned members of HEAL and the public will need to work on getting independent scientists as members of that committee.

CENTERS FOR DISEASE CONTROL (CDC)

Currently CDC has control of two studies concerning the past releases of radiation from Hanford, the Hanford Thyroid Disease Study (HTDS) and the Hanford Environmental Dose Reconstruction Project (HEDR). The actual work for the thyroid study is being conducted by the Fred Hutchinson Cancer Research Center under a contract managed by CDC (for details, please refer to *Progress* #3, "The Human Toll"). Copies are available from the HEAL office or you can use the order form on page 160. The Hanford Environmental Dose Reconstruction Project (HEDR) is one of the studies being transferred from DOE to CDC under the MOU. Although DOE has washed its hands of this project, the day-to-day work on HEDR is still being conducted by Battelle Pacific Northwest Laboratories, a Hanford contractor for over 25 years.

The major uncertainty confronting the HEDR project now is that CDC is unable to accept the study management at this time. When DOE was paying Battelle to do the work, there was little more than an oral agreement to serve as a contract. Without a specific, detailed contractual agreement, CDC is unable to effectively manage the contract because of a lack of accountability standards. CDC staff are working with the Technical Steering Panel and Battelle to collect the necessary information and develop a written

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QUANTITATIVE RISK ASSESSMENTS¹

Quantitative risk assessments typically consist of at least four steps:

1. hazard identification,
2. dose-response assessment,
3. exposure assessment, and
4. risk characterization.

Hazard identification is the determination of whether a substance causes adverse biological effects. The Environmental Protection Agency (EPA) uses a "weight of evidence" approach in judging the hazard potential of a substance. All available scientific evidence is reviewed and evaluated for accuracy, applicability, etc., so that the most suitable data are used to assess the nature of the hazard posed by a chemical.² The effects of substances that are structurally similar to cancer-causing effects, in the absence of a compelling reason to evaluate the hazards of a particular mixture, only individual contaminants are considered.³ If a substance is determined to be nonhazardous, or no data are available indicating that the substance is hazardous, the risk assessment ends here.

At Superfund sites, "indicator chemicals" are selected from lists of contaminants revealed by preliminary analyses to be present at the site. Indicator chemicals are those believed to pose the greatest health hazard at a site; they are chosen on the basis of toxicity (i.e., hazard identification), concentration and amount, mobility, and persistence in the environment. At more complex sites a proportionally larger number of indicator chemicals should be examined.⁴

Dose-response assessments specify the quantitative relationship between a given dose (absorbed amount) of a substance and the severity or probability of an adverse effect; they provide a measure of a substance's potency. Selection of a dose-response relationship can be controversial, in part because the interpretation of most available data requires extrapolation across several categories, usually including species, sex, age, dose range, exposure pattern, and absorption route. Human data derived from epidemiological studies are allotted more weight when available, but most epidemiological studies focus on occupational exposures and situations that are not necessarily representative of environmental exposures in the general population. Deriving dose-response relationships of low doses of potentially carcinogenic substances may be especially controversial⁵ because available data can often be reconciled with more than one mathematical dose-response model.⁶

Exposure assessments are estimates of the degree of individual exposure to a given substance and the number of people exposed. The determination of exposure is crucial in conducting quantitative risk assessments (QRAs). If the actual or potential exposure is not recognized, either because of failure to identify significant environmental transport pathways and exposure routes or because of inaccurate estimation of the number of people exposed or exposure levels, the resulting risk estimate will be misleading.

Direct measurements of human exposure (e.g., analyses of blood or urine samples that indicate individual exposure to a substance) are rarely used in QRAs, and most such measures remain research tools. Instead, QRAs typically use indirect measures of human exposure, such as computer models based on environmental monitoring data, to project estimates of individual dose. For example, some measure (mean, median, or upper confidence limit levels) of ambient contaminant concentrations may be multiplied by standard intake values (estimates of how much air one breathes, water one drinks, etc., over a 70-year lifetime or other appropriate exposure duration) to produce a dose estimate. The estimated dose is then related to the relevant legal standards or to exposure levels that have been predicted to pose no more than "acceptable" levels of risk for the health effect of issue.

Such exposure models may or may not be validated and can vary widely in complexity.⁷ At Superfund sites, because of the difficulties involved in identifying and mapping contaminants at a site, exposure assessments as currently conducted may be one of the risk assessment components most vulnerable to error.

Risk characterization is the process wherein all the foregoing pieces are incorporated into a mathematical model that represents the probable risks of exposure to a given population for which a risk estimate is being calculated. Risk characterization is clearly dependent on the accuracy of its components: the applied hazard information, dose-response relationships, and exposure estimates.

Risk characterization also requires judgments about how to handle uncertainties in the underlying data, how to select appropriate dose-response and exposure estimates from (often incomplete, ambiguous, or conflicting) available data,⁸ how to assemble this information into an overall model, and how to present the results of the assessment and its attendant uncertainty to the risk manager.

¹ Reprinted from U.S. Congress, Office of Technology Assessment, Complex Cleanup: The Environmental Legacy of Nuclear Weapons Production, OTA-O-84-104 (Washington, DC: U.S. Government Printing Office, February 1981).

² U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Risk Assessment Guidelines for Superfund, Human Health Evaluation Manual, Part A, September 1989, pp. 7-1-7-20.

³ Guidelines for the Health Risk Assessment of Chemical Mixtures, 51 Fed. Reg. 24014 (1986).

⁴ C. Zarba, "Superfund Risk Assessments: The Process and Past Experience at Uncontrolled Hazardous Waste Sites," Risk Assessment of Environmental and Human Health Hazards: A Textbook of Case Studies, B. Pasternack (ed.) (New York, NY: John Wiley & Sons, 1988), pp. 273-292.

⁵ B. Pasternack, "Health Risk Assessments: Opportunities and Pitfalls," Columbia Journal of Environmental Law, vol. 14, 1989, pp. 265-279.

⁶ R. A. Fisher, "Is Risk Assessment Really Too Conservative? Rethinking the Remediators," Columbia Journal of Environmental Law, vol. 14, No. 2, 1989, p. 420.

⁷ Committee on the Institutional Means for Assessment of Risks, National Research Council, Risk Assessment in the Federal Government: Managing the Process (Washington, DC: National Academy Press, 1983), p. 38.

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contract by July which would then become effective at the beginning of the next fiscal year, October 1, 1991 (for a detailed description of HEDR, please refer to *Perspective* #3).

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

Quantitative Risk Assessments (QRA) are performed by DOE or its contractors and then reviewed by EPA (for a description of QRAs, see page 7). Even though the EPA has established certain guidelines for how the QRAs are to be conducted, the scientists who are doing the assessment are not legally bound to them. Additionally, DOE has not issued any directives that would assure consistency among the work done by various contractors. These assessments can only consider present and future risks whereas ATSDR's health assessments can also consider those risks from past releases of contamination.

Department of Energy (DOE)

While public pressure and the recommendations of the Secretarial Panel for the Evaluation of Epidemiologic Research Activities (SPEERA) have caused DOE to relinquish its control of some of the most visible health-related research projects, the Energy Department has still managed to retain control over the bulk of its information and scientists. Although the management of the Hanford worker study will be transferred to CDC, DOE will still control the

collection of data used for that study. DOE will still set and enforce its own radiation standards for workers (for all exposure pathways) and for the public (for the surface water and groundwater pathways).

There are a number of areas in which the MOU relies on the good will of DOE to either provide adequate and complete information or to request sufficient funding from Congress for work done by CDC. With the less-than-stellar performance by DOE concerning similar requirements with the Hanford cleanup agreement, it doesn't leave the public with a great deal of hope.

Hanford Environmental Health Foundation (HEHF)

Although it is not a governmental agency, the pivotal role played by the Hanford Environmental Health Foundation (HEHF) is important in fully understanding the impact of the MOU on Hanford. The main focus of HEHF is on Hanford workers and their occupational exposures to radiation. This small but entrenched Hanford contractor is detailed in the next article by Staff Researcher Kim DeVilleneuve (page 11).

STATE GOVERNMENT

Washington State Department of Health

Thanks mainly to Senator Brock Adams, Congress has authorized \$5 million to "develop and implement programs for the benefit of persons who may have been exposed to radiation re-

leased" from Hanford "between the years 1944 and 1972."⁴ Funds for the programs would be transferred from the Department of Energy to Washington, Oregon and Idaho. Washington State would receive \$3 million and Oregon and Idaho \$1 million each.

Under the language which was approved by Congress, the money can only be used for three main tasks:

- 1) the distribution of information on the health effects of radiation;
- 2) establishing a referral system for people who might have been exposed to radiation; and
- 3) if feasible, creating a system of registration and monitoring people.

The three states are in the midst of reviewing public comment and drafting the plan which must be submitted to the Energy Secretary and Congress by May 9, 1991.

CONCLUSION

The transfer of certain programs from DOE to CDC will be an improvement over the dismal experience of the past. However, with so many governmental agencies involved and with overlapping responsibilities, it is almost assured that the scant amount of available resources is not being spent wisely. The agencies involved, Congress, and interested citizens would be well advised to examine and implement the recommendations of the recent OTA report:

Congress could establish an institutional framework and proceed to effectively assess potential health impacts from the

weapons facilities in order to evaluate the possibility of off-site health effects, develop health-based priorities, and address community health concerns.

To implement this policy initiative, Congress could consider all or some of the following approaches:

1. *Establish a new office to direct and coordinate Federal risk assessments, health assessments, State-organized health studies, and dose reconstruction projects.*
2. *Establish a new program to conduct site-specific assessments of whether and where weapons site contaminants pose a threat of exposure to the surrounding communities.*
3. *Establish a national, independent environmental health advisory board to provide guidance regarding exposure assessments, health effects evaluations, and health research needs.*
4. *Require DOE to make all information pertinent to possible health impacts, including data on past environmental releases and current contaminants, generally available.⁵*

Consolidation of the limited resources of personnel and funds into one independent agency could more effectively respond to the legitimate concerns of workers and nearby residents, past, present, and future.

¹ OTA, Complex Cleanup: The Environmental Legacy of Nuclear Weapons Production, February 1991, p. 105.

² ATSDR/DOE MOU, p. 5 and OTA study, p. 129.

³ Telephone conversation with Joel Mulder, ATSDR Region 10, March 4, 1991.

⁴ Telephone conversation with Greg Thomas, ATSDR Region 10, February 22, 1991.

⁵ Section 3136, National Defense Authorization Act for Fiscal Year 1991.

⁶ OTA, Complex Cleanup: The Environmental Legacy of Nuclear Weapons Production, February 1991, p. 135-136.

quotes

"Can people be politically free where they must rely on experts for the information and decisions that largely control their lives?"

"Not only do we need what the experts know, we also need to trust them."

Rev. William H. Houff, Ph.D. From a lecture entitled "Secrecy of the Nemesis of Secrecy," presented at the "Nuclear Landscapes Exhibit," Cheney Cowles Museum, Spokane, WA on Nov. 7, 1990

HANFORD ENVIRONMENTAL HEALTH FOUNDATION

by Kim DeVilleneuve



Fernald Fuel Materials Production Center - Photo by Robert Del Tridici, provided by permission of Harper & Row. Fernald employs 1,000 people and is 20 miles northwest of Cincinnati, Ohio.

The Hanford Environmental Health Foundation (HEHF) is a not-for-profit organization that has provided occupational health services to the Department of Energy (DOE) and Hanford contractors over the past 26 years. Through these years there have been many occurrences at the Hanford site that some do not hold fond memories of.

Whether those memories are related to the Mancuso report, whistle-blower complaints or even the TV series *60 Minutes*, HEHF has been involved with all of them. These cases, plus HEHF's own internal controversies, have raised questions among many as to whether or not HEHF has adequate staffing and oversight to perform its mission.

The Health & Mortality study which HEHF currently conducts actually began in 1964, when the Atomic Energy Commission (AEC) hired Dr. Thomas Mancuso to conduct a study of worker health at government nuclear facilities. Dr.

Mancuso has been said to be one of the best occupational epidemiologists in the world¹ and his research has revolutionized the study of cancer in workers.

In the summer of 1974, Dr. Samuel Milham, a physician for the Washington State Department of Social and Health Services, presented his research to the AEC prior to its publication. Milham's study, based on a three-year analysis of 300,000 men who died in Washington State between 1950 and 1971, found that Hanford workers appeared to have an excess cancer rate. The AEC became alarmed and trouble for Mancuso soon began. Asked by the AEC to publicly refute Milham's findings as "contrary" to his own, Mancuso refused because Mancuso's analysis was still preliminary and he was not ready

to say anything. The following March, the AEC announced that it would not renew his contract. Milham's findings were never published. Battelle Northwest Laboratories at Hanford was commissioned to review Milham's data. Their findings were again unfavorable to the AEC and the Battelle report was also never released.

Near the end of his contract, Mancuso enlisted Dr. Alice Stewart to help analyze his data. Dr. Stewart was a member of his AEC advisory committee and is one of the world's foremost medical authorities on the effects of radiation on human populations. Mancuso, Stewart and George Kneale (Stewart's statistician) struck what was to become the most devastating blow yet against the government's position that

workers weren't experiencing excess deaths from radiation-induced cancer. The three researchers showed that not only did Hanford workers suffer from an excess cancer rate of at least five to seven percent, but that the cancers were being caused by radiation doses that were as much as 10 times lower than levels the government had been insisting were safe.

In the fall of 1977, Mancuso, Stewart and Kneale published their findings in the scientific journal *Health Physics*.² Their survey had become what the *Encyclopaedia Britannica* called the largest study of a normal adult population exposed to low-levels of ionizing radiation in the world, and generated years of debate. There now appears to be general agreement that while there is not a significant excess of overall cancers

"What is at stake is much more than a federal agency's credibility. The health, and indeed the lives, of many Americans may be at risk if we do not demand a well-funded, coordinated, independent effort to understand and address the health risks of past and current nuclear weapons production."

Daryl Kinsland, Physicians for Social Responsibility, from page 6

HEHF

(from page 11)

among Hanford workers compared to the general population, there is a significant excess of multiple myeloma and cancer of the pancreas, both of which can be induced by radiation.¹

HEHF has continued this epidemiological investigation on current and past Hanford employees. However, the management of this study will be transferred to the Centers for Disease Control (CDC) under the recent Memorandum of Understanding (MOU) signed between DOE and the Department of Health and Human Services (see article on page 5 regarding the MOU).

HEHF has undertaken a number of other studies which pertain to the field of occupational health. Besides the Health and Mortality study described above, HEHF is also involved in the Health Surveillance System, the U.S. Uranium Registry and the U.S. Transuranium Registry.

The Transuranium Registry is a study which evaluates the biological behavior of humans who have internally deposited transuranium elements (i.e. plutonium and americium) of occupational origin. As of 9/30/89, the registry had "received a total of 298 postmortem donations, including seven whole bodies" and had "309 living registrants, of whom 25 are whole body donors".² Employers recruit employees diagnosed with cancer who then donate their organs to the registry.

HEHF's Scientific Advisory Committee set four priorities for 1989-90 work: (1) development of strong alliances with the radiobiological scientific community to help in strengthening the work of the Registry; (2) continued development of a comprehensive database to handle registry information (some design work apparently began on that project in 1988); (3) recruitment of volunteers among uranium workers should be pursued vigorously; and (4) criteria for selection of volunteers with potential transuranium exposures should be published and clarified for the various employers who recruit for the registry. Thirteen other laboratories, including one in the United Kingdom, are involved in the registry to aid in its primary objective: to "provide scientific data for verification and refinement of existing radiation protection standards".³

This study was the recent focus of a story by CBS News. The 60 Minutes report, aired on January 13 of this year, raised questions regarding the use of the Transuranium Registry to suppress evidence of compensation claims of past DOE employees that may have died due to radiation exposures on the job. The show also challenged reasons for the study to be in existence. 60 Minutes

site, HEHF has also been involved in other activities that appear less humanitarian. When workers vent their safety and health concerns publicly, they are labeled "whistleblowers". Many whistleblowers have been ordered to see psychiatrists by their supervisors shortly after they have announced their safety concerns. The psychiatrists they see are frequently those with HEHF. One

After the most recent 5-year, \$40 million contract to operate occupational medicine and environmental health services was awarded by DOE to HEHF (the sole bidder), a number of problems arose that created havoc among HEHF employees. In the past two years HEHF has replaced its president and vice-president, was sued by three of its employees, had six registered nurses quit due to alleged mistreatment by upper management and was criticized by the Tiger Team Assessment, a report from the DOE investigative team.⁴

The Tiger Team report of the Hanford site (which was released July 18, 1990), documented some valid problems of HEHF. When a change in top management at the beginning of the calendar year 1990 resulted in significant changes to the previous business methods, many employees became dissatisfied with their positions. HEHF management programs are not adequate to meet existing human resource needs. Interviews with HEHF managers resulted in consistent reports of overcrowded facilities, understaffing, and almost continuous overtime requirements that exceeded several hours per day. HEHF needs to formally structure its operations to allow it to have a broader scope and make a more effective contribution to the Hanford site mission.

As a result of other Tiger Team findings, HEHF has been asked by DOE to take a leading independent industrial hygiene role in providing oversight to Hanford contractors. With increased attention focused on worker and public health and safety at Hanford, as well as the change from defense production to environmental management and waste cleanup, health studies performed by HEHF should play a more important role than they have in the past. It is hoped that the involvement of the Centers for Disease Control will aid and speed that transition.

¹ James T. Ramsey, Commissioner, Atomic Energy Commission.

² Martin, Stewart and Knapp, "Radiation Exposures of Hanford Workers Dying from Cancer and Other Causes," Health Effects, Program Press (197, Vol. 3) (November, 197) 240-249.

³ Catherine Confield, *Chronicles of the Radiation Area: Multiple Exposures*, pg. 142.

⁴ Annual Report of the United States Transuranium and Uranium Registries, 30, 1/88 through 6/30/89, published April, 1990.

⁵ *Ibid.*

⁶ Tiger Team Assessment of the Hanford Site, July 18, 1990 Draft, U.S. Department of Energy.



Dr. Thomas Mancuso - Photo by Robert Del Tredici,
Printed by permission of Harper & Row

also interviewed Ronald L. Kathryn, the Registry Manager at HEHF, who stated that after 22 years of research "nothing really startling has been concluded" from the study. A recent HEAL telephone conversation with Mr. Kathryn yielded a broader response. He said that there have been "a number" of conclusions from the study and noted that several scientific papers have been published (fourteen in 1989). He also mentioned the importance of the registry in studying human bodies in to assure the accuracy and validity of the presence of transuranic elements and their effects on humans.

Although safety standards are a definite concern with some workers at the Hanford

psychiatrist said some whistleblowers he saw were referred by their managers and he thinks this system of referring workers to him is vulnerable to abuse. When one whistleblower was sent to HEHF for a psychological evaluation in August of 1989, the clinic psychologist said in his notes that Westinghouse requested the evaluation. Representative Ron Wyden of Oregon has labeled this use of psychiatric stress for duty manifestations as a type of harassment and "a grotesque strategy that has taken place in totalitarian countries".

Besides whistleblowers having problems with managers, HEHF's own employees have accused it of having managerial problems.

forum



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F70 586-6101

Paul Ziemer

MEMORANDUM OF UNDERSTANDING BETWEEN THE DEPARTMENT OF ENERGY AND THE DEPARTMENT OF HEALTH AND HUMAN SERVICES

A hallmark of Admiral James D. Watkins' tenure as Secretary of Energy has been his policy of openness:

- willingness to disclose openly to the public and to DOE's workers, the facts about DOE facilities;

- willingness to openly welcome scientific analysis of DOE's proposals.

Nowhere is this more apparent than in DOE's approach to health protection and health research.

DOE has managed a huge program of data collection on the health of workers and the public which began under the auspices of the Atomic Energy Commission after the atomic

bombing of Japan. But this data has not been used in ways that provide useful information to the public. Secrecy, and concern about "conflicts of interest," have, in the past, led to a somewhat less than open policy of public disclosures. Under Admiral Watkins' guidance, DOE is now rectifying these overly restrictive measures and is far more open in its information flow to the public.

In 1980, the independent Secretarial Panel for the Evaluation of Epidemiologic Research Activities, headed by Kristine Gebbie, completed its study. The Department has acted upon all of the recommendations of that study, one of the most important of which is the transfer of epidemiologic studies to the Department of Health and Human Services. This transfer, under a formal interagency Memorandum of Understanding (MOU) will:

- put HHS in charge of managing the long-term epidemiological program;

- establishes a scientific panel which will independently review work;

- ensures additional, strong peer review mechanisms;

- requires open communication with the public and workers at DOE facilities.

It is important to recognize that in accordance with the MOU:

- DHHS will have sole responsibility for the design, conduct, analysis, and scientific interpretation of the results for all transferred studies.

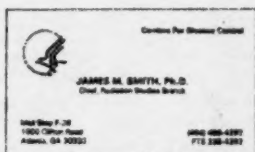
- DOE would continue to

budget all of its epidemiology needs. Thus, the HHS' other work is not impacted. Necessary funding to manage analytic epidemiology studies would be provided to HHS through the Interagency Agreement process.

- Current grants and contracts will be continued while HHS determines which projects should be continued, expanded, or discontinued. In so doing, research-in-progress would be subject to HHS regular peer review monitoring processes.

Finally, in addition to health studies, Admiral Watkins' initiatives include measures to strengthen ongoing health programs for workers now. DOE has a non-delegable responsibility to those workers and Admiral Watkins is fully committed to carrying out this responsibility in an open manner.

'DOE has a non-delegable responsibility to these workers and Admiral Watkins is fully committed to carrying out this responsibility in an open manner.'



James Smith

ASSESSING THE DEPARTMENTS OF ENERGY AND HEALTH AND HUMAN SERVICES' "MEMORANDUM OF UNDERSTANDING"

The primary purpose of the Memorandum of Understanding (MOU) between the Department of Energy (DOE) and the Department of Health and Human Services (HHS) is to transfer to HHS "the authority, resources and responsibility for the design, implementation, analysis, and scientific interpretations of analytic epidemiologic studies of the following populations: residents of DOE facilities; residents of communities in the vicinity of DOE facilities; other persons potentially exposed to radiation; and persons exposed to potential hazards resulting from non-nuclear energy production and use."

The Secretaries of Energy and Health and Human Services signed the MOU in December 1990, following negotiations between the Departments which began in July, 1990. The Secretaries have also appointed a Task Force, consisting of DOE and HHS staff, to begin the process of implementing the MOU, including the specific epidemiologic research projects selected for transfer. One meeting of the Task Force has already taken place in Atlanta. A primary result of that meeting was to agree that HHS' Centers for Disease Control (CDC) needs to visit promptly all sites where the current studies being transferred are underway. Most of these site visits will occur during March and April, by the time this article goes to press, a site visit by a team of CDC scientists and managers will have already been made at Hanford. The MOU calls

for CDC to "initially continue existing DOE grants and contracts, and continue, expand, or discontinue the projects based on [their] evaluation."

What does the Centers for Disease Control plan to do under the Memorandum of Understanding? There are two separate but related aspects to the CDC plan. The first is that of occupational studies to be carried out by the National Institute for Occupational Safety and Health (NIOSH), which is an Institute within the CDC. By far, most of the projects transferred are occupational studies, such as mortality studies of workers at Oak Ridge National Laboratory, Lawrence Livermore National Laboratory, the Fernald Feed Materials Processing Plant (Ohio), as well as the workers at Hanford. NIOSH will now have the Federal responsibility for these projects.

The second aspect of the CDC plan is the community studies. The largest study being transferred is the Hanford Dose Reconstruction (HEDR) project, familiar to most of you. The Fernald Dose Reconstruction project, although listed as a transferred project, has been directed by CDC under a separate MOU with DOE, signed in 1989. This transfer now brings under the same umbrella at CDC both the HEDR project and the Hanford Thyroid Disease Study, the latter being conducted by the Fred Hutchinson Center in Seattle in collaboration with CDC. Both of these projects will be managed by the Center for

Environmental Health and Injury Control, CDC.

It gives us a great deal of satisfaction to have been a member of the Hanford Health Effects Review Panel (formed by CDC and the Washington State Nuclear Waste Board) which recommended in 1986 that both the Hanford Thyroid Disease Study, and the HEDR project be undertaken. To see these large important studies now well underway is, I am sure, quite gratifying to all of us who were members of that Panel.

Of course, the HEDR project is unique. Although the research is performed by Battelle Pacific Northwest Laboratories under Federal contract, the project is directed by an independent, 18-member Technical Steering Panel. I feel that the quality of that direction to date has been outstanding. The Panel includes an excellent mix of highly-regarded scientific experts, community and Native American representatives, and representatives from the State governments of Oregon and Washington. What plans does CDC have for the project? It is simply too soon for anyone to give firm answers to that question. Certainly CDC provides diligent oversight for all projects for which it has responsibility. The primary benefit that CDC can bring immediately to the project is that of assuring that the strongest possible link exists between the HEDR and Hanford Thyroid Disease Studies: the thyroid dose estimates provided by the HEDR project will be essential

for the Hanford Thyroid Disease Study. Of course, HEDR will also provide valuable exposure and dosimetry information for other Hanford radioactive emissions of concern. With such information, informed decisions on the need for further health studies can be made. In addition, the CDC will provide close and effective communication channels between both projects on the one hand and the affected States and Native American Tribes on the other.

What about CDC's future plans? The MOU sets forth the framework for the Department of Health and Human Services to establish its own research agenda and plans for "all energy-related analytic epidemiologic health studies." This will be done with the advice of an HHS Advisory Committee - to be established - which will consist of "research scientists, public health officials, representatives of public interest groups, and representatives of affected parties (e.g., workers, community residents)." This HHS research agenda will obviously be of paramount importance for the conduct of future Federal research in energy-related epidemiologic studies, including dose reconstruction and exposure assessment. Bringing all of this about successfully will, I believe, require unprecedented communication and collaboration among all of us: community residents, workers, scientists, and government. I am certainly envious about the new challenges ahead!

APPENDIX II



Department of Energy

Washington, DC 20585

June 10, 1991

The Honorable James H. Scheuer
Chairman
Subcommittee on Environment
Committee on Science, Space, and Technology
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

On March 7, 1991, Paul L. Ziemer, Assistant Secretary for Environment, Safety and Health, testified before your subcommittee regarding the Environment, Safety and Health Program budget request.

Following the hearing, you submitted written questions to supplement the record. Enclosed are responses to questions 1a-d, 2a-d, 3a-c, 5, 6, 9-11, 12a and b, 13, 14a-c, 15a-c and 16a-c. The remaining answers are in the clearing process and will be forwarded to you as expeditiously as possible.

If we can be of further assistance to you or your staff, please contact our Congressional Hearing Coordinator, Valerie Howard, on (202) 586-2032.

Sincerely,

Jacqueline Knox Brown
Assistant Secretary
Congressional and Intergovernmental
Affairs

Enclosures

QUESTIONS FROM CONGRESSMAN SCHEUER

DOE's Five Year Plan

Question 1. DOE's Five Year Plan for Fiscal Years 1992 to 1996 includes a list of priorities for the Environmental Restoration and Waste Management Program.

- (a) What was the nature and extent of involvement by the Office of Environment, Safety and Health (ES&H) in setting these priorities?

Answer: The Office of Environment, Safety and Health (EH) provides guidance and assistance to the Office of Environmental Restoration and Waste Management (EM) through its normal oversight role by reviewing, commenting and concurring on the draft Five Year Plan, including the list of priorities and the prioritization system used in the Five Year Plan.

- (b) What is the specific role of the ES&H Office in assigning priority to projects proposed by the program offices or field operations?

Answer: EH actively reviews the priorities proposed by EM in the draft Five Year Plan and comments, as appropriate, through its oversight role. Should EH believe that priorities have not been assigned appropriately, the issues are raised to the proper level of management for discussion and resolution. Such issues must be resolved satisfactorily in order for EH to concur on the plan.

- (c) Determining whether any specific project "prevents near-term adverse impacts to workers, the public, or the environment", and therefore falls under priority level one, clearly

involves some degree of subjective judgment. Are these judgments made entirely by the program offices, or does ES&H also have a role in the process?

Answer: As noted in (b) above, the priority for each project is assigned by EH, the responsible program office. However, during the review process, should EH disagree with an assigned priority, the issue is raised, discussed and ultimately resolved at the appropriate level of management. Also, at those sites where a Tiger Team assessment, technical safety appraisal or environmental audit has been conducted and a finding or concern is identified as being an immediate threat or potential threat to health or the environment, EH ensures that the necessary corrective action projects are given immediate attention at the time of the assessment or audit. When reviewing the action plans, which are developed to address Tiger Team findings or appraisals, EH assures that these plans include all projects which are needed to address potential near term impacts. The Five Year Plan then incorporates Tiger Team action plan projects related to environmental restoration and corrective activities.

(d) Please describe the role of the ES&H Office in ensuring that the Energy Department's priorities are consistent with those of the Environmental Protection Agency and state regulatory agencies.

Answer: The priorities of both EPA and the state regulatory agencies are factored into the Department's priorities in several ways. Both EPA and the states are provided the opportunity to review and comment on the draft Five Year Plan and, through this process,

may identify problems with priorities. Also, EPA has the opportunity to review and comment on priorities for environmental projects that are identified in the DOE A-106 Pollution Abatement Plan, for which EH has the lead for preparation.

Many of EPA's and the states' priorities are documented in the Federal Facilities Compliance Agreements, Consent Orders, Settlement Agreements and Interagency Agreements that DOE has executed with the regulatory agencies. EH plays a significant role during the negotiation of these agreements to assure that environmental policies and regulations will be met, and EH must concur on all agreements before execution. In both the Five Year Plan and the DOE A-106 Plan, projects that are needed to meet the commitments of these agreements are identified and given high priority

National Priority System

Question 2. The Environmental Restoration and Waste Management Five Year Plan states that a rigorous, risk-based methodology for setting priorities, known as the "National Priority System," is under development.

(a) What is the role of the ES&H Office in the development of the National Priority System, and when will it be completed?

Answer: The Office of Environment, Safety and Health (EH) does not have a direct role in the development of a national priority system for the Environmental Restoration and Waste Management (EM) Five Year Plan. Consistent with our role as an internal, independent oversight organization, EH will provide advice to EM during development of their system; will review, comment and concur on the draft Five Year Plan including the list of priorities and prioritization system; and will evaluate its effectiveness when implemented.

(b) Please describe the precise relationship between the results of the "Risk Information System" and the development and use of the National Priority System.

Answer: The EM national priority system will build on the process and data generated for the Risk Information System (RIS), but will not necessarily use the quantitative results of RIS. Development of RIS was DOE's first serious attempt to develop a risk based decision making process. While the processes currently being employed by EM are different, many of the methodologies and concepts developed for the RIS are being considered by EM for future prioritization efforts. In

addition, much of the data gathered as input to RIS, particularly that which defines environmental priority setting, has continuing applicability to other methods being developed by EM.

- (c) Please quantify the total cost of developing and implementing the Risk Information System, including the following: amounts budgeted for fiscal years 1991 and 1992, the total number of federal Full Time Equivalents, and expenses for extramural resources including contractors.

Answer: The cost for development and implementation of RIS over the period beginning FY 1986 has been approximately \$6.5 million and 2-3 FTEs. No funds were budgeted in FY 1991 or FY 1992. All activity will be completed during FY 1991 using prior year carryover funds.

- (d) Please describe the risk assessment methodologies other than the Risk Information System DOE uses to establish site cleanup priorities.

Answer: The only other methodology currently being used to establish site cleanup priorities is that described in the current EM Five Year Plan.

Environmental Regulations and Interagency Agreements

Question 3. Testimony received by the Subcommittee indicated that environmental restoration activities are generally dictated by the need to comply with environmental regulations and Interagency Agreements.

(a) What is the exact nature of ES&H Office's involvement in the negotiation of these Interagency Agreements?

Answer:

The Office of Environment, Safety and Health (EH) actively participates in negotiations in an oversight role to ensure that consistent policy direction and technical assistance is provided to DOE field and Program Offices. To date, EH has been involved in the negotiation of the majority of the 61 executed compliance and cleanup agreements and is currently participating in many of the ongoing negotiations for 24 new agreements. EH also interacts on a routine basis with EPA Headquarters to ensure it is informed of DOE's compliance and cleanup activities, to develop model language, where appropriate, to expedite reaching agreements, and to resolve policy issues which have been raised for Headquarters resolution.

(b) What is the role of the ES&H Office in both evaluating the adequacy of the Energy Department's resources for complying with environmental regulations and Interagency Agreements, and ensuring that adequate compliance will occur in the future?

Answer:

The primary responsibility for evaluating the adequacy of DOE's resources for complying with environmental regulations and Interagency Agreements lies with the program offices. EH in its review and approval of action plans which are developed in

response to Tiger Team assessments and environmental audits, takes into consideration the adequacy of resources that DOE field and program offices allocate to environmental compliance. As noted in (a) above, EH participates in the negotiations and through this process further considers the adequacy of resources to meet schedules and milestones established in the agreements.

(c) What changes have been made or are anticipated to solve current noncompliance problems at facilities?

Answer: Secretary Watkins' 10-Point Plan established a commitment to full compliance with the letter and spirit of environmental laws, regulations, and requirements. Responsibility for correcting the noncompliance has been placed firmly with the program offices with line management responsibility. EH has established many initiatives to further improve environmental compliance. Some of these include Tiger Team assessments, environmental audits, training on environmental laws and regulations, increased emphasis on tracking and occurrence reporting, a compliance strategy that requires full and open communication with states and Federal regulators, negotiation of additional compliance and cleanup agreements to establish compliance and cleanup schedules and milestones, and enhanced use of the award fee process for improvement of DOE Management and Operating contractors' ES&H performance. In addition, DOE field and Program Offices have established self-assessment

programs to assist in identifying compliance problems and associated root causes.

Contractors' Role in Tiger Team Assessments

Question 5. The ES&H Office has contracted with several different firms to conduct environmental surveys and provide technical support for Tiger Team assessments. Many field offices scheduled for a Tiger Team assessment have hired a contractor to assist in preparing for the assessment. Contractors also assist in performing Tiger Team assessments. In any case, was the same contractor hired to perform both functions and if so, does this create the appearance of a conflict of interest?

Answer: We believe that using a contractor on a Tiger Team that had assisted the field office with preparation for a Tiger Team assessment would create the appearance of a conflict of interest. Tiger Team technical experts are selected so as to avoid a conflict of interest or even the appearance of a conflict of interest. These experts must be able to provide an independent, unbiased evaluation of our facilities to be considered as members of Tiger Teams.

Status of Environmental Survey Preliminary Report

Question 6. In 1988 DOE released the "Environmental Survey Preliminary Report" which ranked in order of priority environmental problems found at DOE facilities. The fiscal year 1992 budget request for DOE does not include funding for the completion of the Summary Survey Report, and indicates that no money for fiscal year 1991 was spent for this purpose. Please indicate whether or not the ES&H office is in the process of completing the report, and if so, how this activity is being funded.

Answer: The final reports for the Environmental Survey program will be completed in FY 91 using carryover funding from the previous fiscal year.

Waste Minimization

Question 9. Please describe any ongoing efforts within the ES&H Office to incorporate waste minimization into the design process for plant modification and new plant construction, and indicate the number of ES&H staff specifically assigned to waste minimization.

Answer: The Deputy Assistant Secretary for Environment, EH-20, currently has two ES&H staff assigned to waste minimization issues. The Office of Environmental Guidance, EH-23, was responsible for development and coordination of DOE's waste minimization guidance issued in June 1990 across the DOE complex in response to requirements in DOE Orders 5400.1, "General Environmental Protection Program" and 5400.3, "Hazardous and Radioactive Mixed Waste Program". EH-23 also initiated DOE's waste reduction policy statement which stipulates that waste reduction will be a prime consideration in facility upgrade or modernization and new facility design. In addition, EH-23 participates in several EPA regulatory work groups relating to waste minimization, and is responsible for developing Departmental positions on various waste minimization and pollution prevention regulatory proposals. Also, EH-23 is an oversight member of the DOE Waste Minimization Steering Committee made up of representatives from the DOE Program Offices which have programmatic responsibility for implementing a waste minimization program at those facilities under their purview. The Office of Environmental Compliance, EH-22 reviews DOE field documents prepared pursuant to DOE Orders 5400.1 and 5400.3 for compliance issues related to waste minimization.

Dissemination of Information on Cleanup Activities

Question 10. One of the primary messages in a recent report by the Office of Technology Assessment, Complex Cleanup, is that the Energy Department lacks credibility in the public eye because of its past practices and its failure to disclose information to the public. What information, aside from the Five Year Plan, is not being made or could be made available to the public? What are DOE's plans for disseminating to the public information useful for characterizing and assessing contamination at DOE facilities, including data gathered in the Environmental Survey Program.

Answer: For all DOE environmental restoration sites being remediated under the authority of the Comprehensive Environmental Response, Compensation and Liability Act or CERCLA, the Department is carrying out the public participation requirements of CERCLA and the National Contingency Plan (NCP). Where DOE is remediating a site under another applicable law (e.g., State law or the Resource Conservation and Recovery Act) DOE will follow the public participation requirements contained in that law; however, if that law has no public participation requirements, it is the Department's position that the public participation procedures of CERCLA and the NCP should be followed.

A major component of the public participation requirements under CERCLA and the NCP is preparation of a community relations plan. This plan specifies the community relations activities that DOE expects to undertake during the CERCLA response action. The purpose of the plan is to ensure the public appropriate opportunities for involvement in a wide variety of CERCLA-related decisions at the site, and provide appropriate

opportunities for the community to learn about the nature of the site and environmental restoration activities being conducted thereon. CERCLA and the MCP also require that an Information Repository and an Administrative Record be maintained at a CERCLA site or nearby location accessible to the public. Copies of the community relations plan, and other site-related documents made available to the public, such as the site characterization and assessment reports, will be maintained at the established Information Repository.

Other sources of DOE information include the Annual Environmental Monitoring Reports from each DOE Operations Office which contain data on the environmental monitoring programs at each of DOE's operating facilities. These reports are made available to the public at the public reading room at each Operations Office. The DOE Tiger Team reports, both draft and final, which assess ES&H program at DOE operating facilities are made available to all interested parties at the facility's public reading room as well as the DOE Headquarters public reading room. These reports can also be purchased from the National Technical Information Service (NTIS). In addition, copies of the action plans prepared in response to the Tiger Team reports are available at each facility's public reading room.

Status of Order on Medical Program

Question 11: The DOE contractor medical program, as outlined in DOE Order number 5480.8 published in May 1981, has been revised in draft annually since 1987 and has yet to be officially published. Since this document prescribes the minimal occupational health medical program requirements for medical personnel to execute, why has there been a three-year delay in upgrading this health standard?

Answer: The draft Department of Energy (DOE) Order 5480.8A, "Contractor Medical Program", was developed in conjunction with a panel of medical professionals. This necessitated a number of meetings and subsequent reviews, all of which extended over a period of a year. The draft Order was revised as a consequence of these reviews and was distributed to all appropriate DOE Headquarters Offices and to all Field Offices for comments. The Office of Health has responded to all essential comments and is now attempting to resolve all nonconcurrences. The final package should go forward for administrative approval very shortly.

Status of the Health Surveillance Program

Question 12. In March, 1990 the Secretarial Panel for the Evaluation of Epidemiologic Research Activities recommended that DOE institute a standardized, comprehensive occupational health surveillance program for DOE contract workers. What progress has DOE made in this regard?

Answer: A number of specific steps have been taken to establish a comprehensive occupational health surveillance program. These steps include:

- o In April 1990, the Office of Epidemiology and Health Surveillance was established within the Office of Health to respond specifically to the need for worker health surveillance program development and implementation.
- o A guidance document was prepared in November/December 1990 to focus on specific issues related to development of a health surveillance system for the DOE.
- o DOE held its first DOE Health Surveillance System Workshop in January 1991, with attendance by representatives of labor, private industry, academia, occupational medicine, and government. All attendees received advance copies of the guidance document described above. The workshop focused specifically on developing a comprehensive program of occupation health surveillance.

- o Following recommendations of the HSS Workshop attendees, a draft program plan was developed during February and March 1991. Currently under internal review in the Office of Health, the draft plan will be distributed to workshop attendees, DOE occupational medical directors, and other affected parties within the next two weeks.

- o A presentation of the draft Health Surveillance System program plan has been scheduled during the DOE Occupational Physician's business meeting to be held on May 2, 1991, during the annual meeting of the American College of Occupational Medicine (ACOM) in San Francisco. The presentation will provide an enhanced opportunity for occupational medical directors to ask questions and comment on program development.

- (a) There is a clear need for community health studies for communities surrounding DOE facilities. How will these studies be conducted and by whom?

Answer: Through State Health Agreements (SHA) and Agreements in Principle (AIP) requested by certain "host" states (those states in which DOE facilities are located), community health studies are being developed and implemented. The SHA's and AIP's are state initiated; not all host states have expressed a need or desire for such agreements. Kentucky, Tennessee, California, Florida, and Colorado are among the states that have established agreements with DOE.

Under these agreements, either the state government or DOE can recommend specific community studies of interest. In either case, DOE will provide both technical and financial support for the studies. The state may provide its own expertise for the conduct of the studies or subcontract the work to acquire the needed expertise and personnel.

In addition, DOE will be issuing a grant to the Medical University of South Carolina to develop and maintain a birth defects and cancer registry for communities near the Savannah River Plant.

An additional method by which DOE can initiate community studies is through its Memorandum of Understanding (MOU) with the Department of Health and Human Services (DHHS). Through the MOU, DOE can recommend that community studies be carried out. The Centers for Disease Control would have management oversight for studies initiated in this manner, DOE would provide the funding for the studies.

- (b) DOE's occupational medical programs have emphasized radiation protection at the possible risk of ignoring other workplace exposures. What specific occupational exposure studies are underway and when will they be completed?

Answer:

The most recently initiated project in this area is called "Epidemiology of Mixed Chemical Exposures: Feasibility Study". The study is being conducted at the Rocky Flats

Plant by Los Alamos National Laboratory to establish the feasibility of determining estimates of individual exposures to chemicals that are adequate for use in epidemiology studies. An assessment of methods for inferring individual exposures from grouped information such as chemical purchase orders, work area inventories, and plant processes will be conducted. Pending the successful development of methods of estimating individual exposures, a protocol will be developed to follow up a sample of Rocky Flats workers using these methods in a case control study examining the risk of several types of malignancy. Target date for completion of all phases of this feasibility study, including development of a protocol for a case control followup study, is March 1993.

The Office of Health is sponsoring a study by the Oak Ridge Associated Universities to identify diseased and nondiseased Oak Ridge beryllium workers, and to determine the efficacy of the peripheral blood lymphocyte transformation test in identifying early beryllium disease (or "sensitized" individuals). In its first stage, the study is currently attempting to identify the population of "beryllium exposed" and "beryllium nonexposed" workers at Oak Ridge National Laboratory Y-12 plant. This phase is scheduled for completion in September 1991. Under the Memorandum of Understanding between DOE and DHHS, conduct of the second

phase of the project to establish the efficacy of an experimental diagnostic procedure (the peripheral blood lymphocyte transformation test) will be transferred to the Centers for Disease Control. Completion of the second phase will depend on the as yet undetermined CDC schedule for implementation.

The DOE's Rocky Flats Plant occupational medical staff are also cooperating with National Jewish Center investigators in a clinical trial to determine the efficacy of the peripheral blood lymphocyte transformation test as an indicator for early detection of chronic beryllium disease. The study is not funded by DOE, but by the National Institute for Environmental Health Sciences (NIEHS). The study is open-ended. Efforts to secure continued funding are under way and the investigators continue to enroll participants. No completion date has been set.

Oak Ridge Associated Universities (ORAU) investigators completed a study of lymphatic system cancer among female employees at the Y-12 facility in 1983, finding no association between chronic exposure to dusts of uranium and uranium compounds and death due to lymphatic system cancer.

ORAU conducted a study of mortality among a cohort of Y-12 Plant workers exposed to phosgene gas. Emphasis was placed

on the potential associated between phosgene gas exposure and increased mortality from diseases of specific organ systems, such as the respiratory system. Although the formal study was completed in 1984, there are plans for updates of the analysis focusing on this group at five-year intervals.

A similar study of Y-12 workers focused on elemental mercury as the exposure of interest and death from diseases of the liver, lung, kidney, of central nervous system. The study was completed in 1984. In conjunction with this study, the University of Michigan conducted a study of morbidity among a subgroup of Y-12 mercury workers. ORAU provided technical assistance for the conduct of this morbidity study.

Begun in 1983, the Oak Ridge Associated Universities study of mortality among workers at the Oak Ridge Gaseous Diffusion plant is ongoing. This study is linked to similar efforts involving the gaseous diffusion plants located at the Paducah, Kentucky and Portsmouth, Ohio facilities. Exposures of interest include uranium hexafluoride, insoluble uranium oxides, hydrogen fluoride, other fluorocarbons, and metallic nickel. Completion of the analysis of the Oak Ridge cohort is anticipated in 1992.

A mortality study of workers exposed to metallic nickel powder at the Oak Ridge Gaseous Diffusion Plant was completed in 1984. Specific attention was given to causes of death involving sinonaasal and respiratory tract cancers.

Initiated in 1987, a health surveillance study of gas centrifuge workers at the Oak Ridge Gaseous Diffusion Plant is focusing on exposure to epoxy resins and various solvents. Both morbidity and mortality outcomes are included in the study, with particular attention paid to cancer and other chronic disease of organ systems known to be targeted by these substances (e.g., liver, lung, kidney, bladder, etc.). The anticipated date of completion is 1993.

A cohort mortality study of welders at Oak Ridge facilities was initiated in 1978, with nickel oxides and other hazards associated with welding as the exposures of interest. The results of the original analysis were published in 1981. An update of this study was initiated in 1987; data collection for the update has been completed and the analysis is under way. The updated report is anticipated during 1992.

Plans for Implementing OSHA Regulations Governing Cleanup Workers

Question 13: What plans does ES&H have for implementing the Occupational Health and Safety Administration regulations governing medical surveillance of hazardous waste cleanup workers?

Answer: A two-day workshop was held by the Office of ES&H on April 4-5, 1991, involving members of seven working groups developing a comprehensive response to the recent OSHA evaluation of DOE workplace safety programs. The purpose of the workshop was to define work tasks and schedules. Working Group members included representatives from DOE Offices of Administration and Human Resource Management; Procurement, Assistance and Program Management; Financial Management and Controller; Scientific and Engineering Recruitment, Training, and Development; Energy Research; Assistant Secretary for Defense Programs; Assistant Secretary for Nuclear Energy; and Environmental Restoration and Waste Management.

Although the Department of Energy has adopted the OSHA regulations in principle, their full implementation will follow internal review and development of implementation strategies. A general review is now under way, but it has not yet focused specifically on regulations pertaining to medical surveillance of hazardous waste clean-up workers.

It is anticipated that hazardous waste workers will be identified as a specific focus group for health surveillance in

the Health Surveillance System Program now being developed within the Office of Epidemiology and Health Surveillance.

Status of Implementing Revised NEPA Regulations

Question 14. The Energy Department is currently revising its regulations for implementing the National Environmental Policy Act (NEPA).

(a) When will these revisions be finalized?

Answer: DOE's proposed NEPA Regulations were published in the Federal Register on November 2, 1990 (55 FR 46444). We received a substantial number of public comments on the proposal, and are reviewing them carefully in preparing the final rule. We expect to complete the process before the end of the calendar year.

(b) Commercial and DOE nuclear reactors have traditionally been required to prepare an Environmental Impact Statement prior to a restart after, for example, safety problems have been corrected or a reactor has been significantly upgraded. Why is DOE now proposing to exempt itself in some instances from this critical requirement?

Answer: DOE did not intend its proposed categorical exclusion for restart (Subpart D, Appendix B.1.9, 55 FR at 46460, November 2, 1990) to apply under circumstances that might warrant an environmental impact statement. Rather, it was intended to apply to resumption of operations after a temporary shutdown (i.e., less than approximately two years) for minor safety or environmental improvements; i.e., improvements that could themselves be categorically excluded under Subpart D of the NEPA regulations. A combination of such actions would normally result in little or no change in environmental impacts. The Department is reconsidering all proposed

categorical exclusions, however, in light of public comments received on the proposed NEPA regulations.

- (c) DOE's proposed regulations for implementing NEPA would also exempt DOE from having to prepare an Environmental Impact Statement for the removal of contaminated equipment and material from a hazardous waste site. Would an action such as the removal of plutonium down-stream from the filters at the Rocky Flats plant in Colorado be exempt under the proposed regulations?

Answer:

We interpret Question 14(c) regarding "removal of plutonium downstream from the filters" to refer to DOE's ongoing program to remove plutonium from duct work in various Rocky Flats Plant facilities. The DOE proposed a categorical exclusion for "Removal of contaminated material and equipment . . . if the action is not part of a decommissioning project" (Subpart D, Appendix B.1.2, 55 FR at 46460, November 2, 1990). If this categorical exclusion would become effective with the promulgation of the final DOE NEPA regulations, it might apply to selected plutonium removal activities at the Rocky Flats Plant. It is important to note, however, that categorical exclusions represent classes of actions that normally do not require preparation of an environmental impact statement or an environmental assessment. Before applying a categorical exclusion, DOE first reviews each proposed action to assure that the activity would fit the class and that there are no extraordinary circumstances that might result in the normally excluded action having a significant environmental

impact. As part of this review, DOE's proposed NEPA regulations would establish a number of specific eligibility criteria (Section 1021.410(b)) that must be met for an activity to be categorically excluded. As mentioned above, the Department is reconsidering all proposed categorical exclusions (and the eligibility criteria) in light of public comments received on the proposed NEPA regulations.

Environmental Compliance Challenges

Question 15. It is apparent that DOE faces significant environmental compliance challenges, both now and in the future.

- (a) Has the ES&H Office identified the major environmental compliance challenges facing DOE in the next five years, in terms of cost, technical complexity, and potential effects on DOE's missions?

Answer: Through daily interaction with field and program offices, Tiger Team assessments, environmental audits, and the DOE issue coordination process, EH is identifying many complex environmental challenges that DOE must deal with, not only over the next 5 years but for many years beyond. Some of these challenges include: providing adequate storage, treatment, and disposal of radioactive and hazardous mixed waste; developing cleanup technologies for unique wastes; developing technologies for sampling and analyzing mixed wastes in order to characterize them adequately for waste management regulations; and providing adequate monitoring to meet requirements of the regulations for emissions of radionuclides. EH and the program offices are working together to develop solutions to the problems and to evaluate the impacts to DOE's missions. Program and field office action plans, compliance agreements and many other documents that resolve significant environmental issues must be reviewed and approved or concurred on by EH .

- (b) Has the ES&H Office analyzed these challenges and informed the program offices about them?

Answer: EH interacts on a daily basis with both field and program offices not only to inform the offices of the challenges identified, but to work out solutions to these challenges. Identification and analysis of these challenges are provided through results of Tiger Team assessments, technical safety appraisals, environmental audits, etc., which are shared immediately with responsible field and program offices. In addition, trend analyses and summary documents are periodically prepared to highlight significant concerns and findings. These analyses are proving to be useful to EH, and to program and field offices as they conduct self assessments and audits of their programs and facilities.

- (c) Has the ES&H Office identified compliance challenges that may face DOE in the longer term, for example in the last half of the 1990's?

Answer: As noted in (a) above, many of the problems and challenges identified to date are expected to continue beyond the next five years. In particular, cleanup of the Department's defense facilities, where contamination is pervasive will require years. In addition, treatment and disposal technologies for much of DOE's mixed wastes must be developed, designed and constructed. Technology for decontamination and decommissioning of old, uniquely constructed facilities presents major challenges for research and development. DOE also anticipates that environmental laws and regulations will continue to become more

complex and meeting the requirements will present many additional challenges that remain to be identified

Efforts in Electric and Magnetic Fields Research

- Question 16. Please describe ongoing research efforts under the ES&H program on the human health effects of exposure to electric and magnetic fields (EMF). In addition, please describe or identify:
- (a) Research and development activities conducted jointly with the Office of Conservation and Renewable Energy.
 - (b) The amount of funds available to the ES&H Office from the Office of Conservation and Renewable Energy for supporting EMF research in fiscal year 1991, as well as the budget request for this research in fiscal year 1992.
 - (c) The staff specifically assigned to conduct such research.

Answer: The Office of Environment, Safety and Health (EH) has not conducted any epidemiologic studies related to the possible association between human health effects and exposure to electromagnetic fields (EMFs). Within EH, the Office of Epidemiology and Health Surveillance (OEHS) currently is developing ideas for possible epidemiologic research to be conducted by DOE in this area. We feel that the Department of Energy has the potential resources to support this research agenda.

OESH staff members have provided epidemiologic expertise to two major research meetings this year. They have served as panel members for the National Institute for Occupational Safety and Health Workshop on EMF Research and The Electric Power Research Institute workshop on "Future Studies of Health Effects of EMFs". In addition, OESH staff members have reviewed the draft report from the Environmental Protection Agency entitled, "Evaluation on the Potential Carcinogenicity of EMFs".

OEHS frequently evaluates epidemiologic research on EMFs in response to Congressional inquiry. In addition, the Office responds to letters from citizens regarding their health concerns related to potential EMF exposure from video display terminals, electric power lines, and other sources.

- (a) No research or development activities on EMFs are conducted jointly with the Office of Conservation and Renewable Energy (CE). The focus of research within CE is biological; work is being conducted on genetic material, cells, tissues, rodents, and primates.
- (b) The CE budget for FY 1991 is 3.5M, and the budget request for FY 1992 is \$5M. There are no funds budgeted for research program support in ES&H from CE.
- (c) OEHS staff members have expertise in occupational and environmental epidemiology, as well as industrial hygiene, health physics, and genetics and human biology. There are five Ph.D. epidemiologists among OEHS staff who have published extensively in the areas of chronic diseases and cancer epidemiology, in addition to studies on occupational exposure to EMFs. These staff members belong to various professional organizations including, the American College of Epidemiology, the Society for Epidemiologic Research, and the American Conference of Governmental Industrial

Hygienists. They have come to the DOE from other DOE facilities, federal agencies (the National Cancer Institute, National Cancer Institute, the Agency for Toxic Substances and Disease Registry), state health departments, cancer registries, and academic appointments. These staff members are routinely asked to serve as peer reviewers for professional journals and scientific review committees.

**Department of Energy**

Washington, DC 20585

June 14, 1991

The Honorable James H. Scheuer
Chairman
Subcommittee on Environment
Committee on Science, Space, and Technology
U.S. House of Representatives
Washington, DC 20515

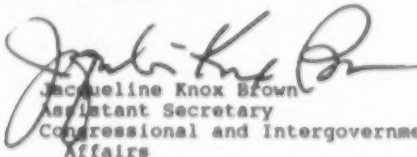
Dear Mr. Chairman:

On March 7, 1991, Paul L. Ziemer, Assistant Secretary for Environment, Safety and Health, testified before your subcommittee regarding the Environment, Safety and Health Program budget request.

At the time of my last letter to you dated June 10, 1991, we explained that the remaining answers would be forwarded to you. Enclosed are the answers to complete the hearing record.

If we can be of further assistance to you or your staff, please contact our Congressional Hearing Coordinator, Valerie Howard, on (202) 586-2032.

Sincerely,



Jacqueline Knox Brown
Assistant Secretary
Congressional and Intergovernmental
Affairs

Enclosures

Resource, Conservation, and Recovery Act (RCRA)

Question 4. The Energy Department is subject to compliance with the "land ban" restrictions mandated by the Resource Conservation, and Recovery Act (RCRA), but has received variances until 1992 for most of the wastes included in these restrictions.

- (a) Identify all of the wastes included in the land disposal restrictions for which DOE is not currently exempt.

Answer: The Department of Energy is not exempt currently from the land disposal restrictions for solvents, dioxin, and California list wastes. Most of the Department's Radioactive Mixed Waste (RMW) contains a California list component and is currently subject to the corresponding California List Treatment Standards. Approximately one third of DOE's RMW is solely Thirds mixed waste that is covered by the LDR national capacity variance granted through May 1992.

- (b) Please identify all instances of noncompliance with the RCRA storage prohibition and include for each instance the site name, facility name, waste types and volumes, and storage situation for these prohibited wastes.

Answer: On September 19, 1989, the Department entered into a Federal Facilities Compliance Agreement (FFCA) with EPA and the Colorado Department of Health to address "land ban" restrictions, including storage, for radioactive mixed wastes (RMW) at the Rocky Flats Plants. The FFCA required DOE to prepare a National Report with information on all DOE sites that store RMW subject to the land disposal restrictions under RCRA. The enclosed report entitled Department of Energy National Report on

Prohibited Waste and Treatment Options was prepared to meet that requirement and is provided for your information. In addition, in 1990, DOE amended the Tri-Party Agreement for the Hanford Site to address mixed waste land ban issues, and has recently executed a FFCA with the Environmental Protection Agency to address mixed waste land ban issues at the Savannah River Site.

Tiger Team Assessments

Question 7. The "Tiger Team" assessments conducted so far have identified hundreds of environmental, safety, and management problems at DOE facilities.

- (a) For each facility that has had the benefit of a Tiger Team assessment, please provide the number of findings that have been corrected compared to the total number of "compliance findings" and "best management practices findings".

Answer: The action plan structure has evolved with time and we do not have a comprehensive listing of the information in the format requested. We are currently in the process of collating this information and can provide you with the results in late June. All of the final action plans which have been approved for implementation by the Secretary have been distributed to interested parties in Congress.

- (b) The Energy Department has assigned responsibility for followup to Tiger Team findings to "self-assessment" groups in the field offices. Please provide a list of all existing "self-assessment" offices, including the facility name, site name, office manager's name, number of staff, budget, and date established.

Answer: The responsibility for followup to Tiger Team findings has not been assigned to "self-assessment" groups or offices. The Tiger Team action plan development, implementation and followup is the responsibility of the Program Secretarial Officers (and through them the DOE line organization and site contractor), who are assigned the responsibility of identifying and characterizing environmental, safety and health concerns related to their operations/organization.

In January of 1990, the Secretary directed all line organizations to implement comprehensive self-assessment programs to identify and characterize environmental, safety and health concerns relating to their operations. In July of 1990, the Secretary provided all Departmental Elements with "Guidance on Environment, Safety, and Health (ES&H) Self-Assessment." The enactment of "self-assessment groups or offices" as such for environment, safety and health concerns was not required. However, for nuclear safety, self-assessment offices are required. Specifically, in September of 1989, the Secretary directed that NE, DP and NPR establish Nuclear Self-Assessment Offices reporting directly to the PSOs to perform independent design, construction and operational evaluations of nuclear facility safety (SEN-6A-89). In February of 1991, the Secretary directed that EM, ER and RW also establish Nuclear Self-Assessment Offices (SEN-6C-91).

- (c) What measures are in place to ensure that these offices have sufficient independence from the mission objectives of the program offices to perform their duties adequately?

Answer:

The Secretary's July 1990 guidance specifically contains direction related to self-assessment participants and their responsibilities (attached). In addition, he instructed each Tiger Team to specifically evaluate facility self-assessments. EH and NS evaluate line management self-assessment program performance in connection with their

oversight activities (e.g., readiness reviews, environmental audits, technical safety appraisals).

- (d) Are any ES&H staff assigned the responsibility of tracking the corrective actions taken by the facilities to address Tiger Team findings and the progress in implementing facility "Action Plans"?

Answer:

The Office of Special Projects (EH-5) has been assigned the responsibility for the management of the day-to-day operations of the Tiger Team effort within EH. EH-5 is placing the final Tiger Team Action Plans in a computer data base to facilitate use by DOE headquarters and the field. Periodic updates on the current status of the implementation of Tiger Team action plans are required to be provided to EH as directed by the Secretary in August of 1990 (SEN-7A-90). This information will be included in the computer data base. The information contained in the action plans and updates is provided to other offices within EH to help them prepare for the performance of routine oversight activities (e.g. readiness reviews, environmental audits, technical safety appraisals). In addition, on March 13, 1991 the Secretary approved an initiative for the Long-Term Tiger Team Program. In early 1992, EH will begin to implement this program which is designed to focus specifically on Tiger Team Action Plan followup.

The Advisory Committee on Nuclear Facility Safety (ACNFS)

Question 8. The Energy Department has transferred responsibility for nuclear safety to the Office of Nuclear Safety. Meanwhile, the charter of the Advisory Committee on Nuclear Facility Safety (ACNFS) is being allowed to expire and ACNFS responsibilities have been transferred to the Office of Nuclear Energy. How will the Office of Nuclear Energy carry out the former responsibilities of the ACNFS?

Answer: Since the question relates to activities of the Office of Nuclear Energy, I asked the Assistant Secretary for Nuclear Energy to respond. His response follows:

The question is based on an erroneous premise. The Department has not transferred responsibility for nuclear safety to the Office of Nuclear Safety and the responsibilities of the ACNFS have not been transferred to the Office of Nuclear Energy.

The Assistant Secretary for Nuclear Energy is assigned the responsibility for developing and coordinating Departmental policy for nuclear reactors and non-reactor nuclear facility safety. These policies are reviewed and concurred in by the Office of Nuclear Safety.

Nuclear safety is specifically the responsibility of those Program Secretarial Officers (PSO) in the Department who have programs involving nuclear energy

In order to assure proper oversight of reactors and non-reactor nuclear facilities, both PSOs and the Office of the Secretary

need the means to verify independently that the expected level of nuclear safety performance is being achieved. Therefore:

The Office of Nuclear Safety reports directly to the Office of the Secretary and advises the Secretary whether line management and its self-assessment functions are adequately assuring nuclear safety. The Office of Nuclear Safety has no line authority.

In the offices of each PSO with nuclear safety responsibilities, separate offices reporting directly to the PSOs, perform independent design, construction, and operational evaluations of nuclear facility safety. These are the Nuclear Self-Assessment Offices.

This alignment best promotes the full acceptance of responsibility for nuclear safety by line management, while providing strong independent internal and external oversight. These arrangements do not absolve line management of its responsibility for both safety and production or research, and still afford the Program Secretarial Officers and the Office of the Secretary separate means by which to assure nuclear safety.

APPENDIX III

**Department of Energy**

Washington, DC 20585

May 20, 1991

The Honorable James H. Scheuer
Chairman
Subcommittee on Environment
Committee on Science, Space, and Technology
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

On March 7, 1991, Dr. Clyde Frank, Associate Director, for Technology Development, Office of Environmental Restoration and Waste Management, testified before your subcommittee on Environmental Restoration and Waste Management budget request for the Office of Technology Development.

Following the hearing, you submitted written questions to supplement the record. Enclosed are the answers to those questions.

If we can be of further assistance to you or your staff, please contact our Congressional Hearing Coordinator, Valerie Howard, on (202) 586-2032.

Sincerely,

A handwritten signature in dark ink, appearing to read "Jacqueline Knox Brown", is written over the typed name.

Jacqueline Knox Brown
Assistant Secretary
Congressional and Intergovernmental
Affairs

Enclosures

QUESTIONS FROM REPRESENTATIVE SCHEUER

Manpower Needs

Question 1: What types and numbers of new DOE employees, excluding contractors, are needed throughout the weapons complex to manage and conduct all of the necessary work in each of the following areas:

- (a) The Technology Development Program?
- (b) The Environmental Restoration Program?
- (c) The Waste Management Program?

Answer: DOE's workforce includes personnel from broad engineering disciplines (nuclear, civil, environmental, sanitary, mechanical, chemical, metallurgical, agricultural, industrial, materials, ceramics, biotechnology, electrical, petroleum, and other related engineering) and sciences (applied mathematics, environmental sciences, health physics, ecology, industrial hygiene, chemistry, radiochemistry, geology, hydrology, material science, toxicology, epidemiology, radioecology, applied physics, or other related sciences) as well as legal and regulatory professionals and project management experts and contracting officials.

DOE's needs within the Environmental Restoration and Waste Management program are currently being assessed. Preliminary estimates indicate a growth of 50% to 70% over the next five years. The source of this growth will likely be retrained personnel and graduates, with the proportionate breakdown as yet unknown. We currently have approximately 10,000 to 12,000 DOE and Contractor scientists, engineers, and technicians within the EM programs.

It appears that EM programs will require larger staff in the future and we are attempting to quantify those manpower needs. Specifically, in regards to DOE employees only, the projection related to the FY 1992 budgeted FTEs for Headquarters and the Field are as follows:

	<u>Total FTEs</u>
Program Direction	61
Technology Development	111
Environmental Restoration	272
Waste Management	650
Total	<u>1094</u>

QUESTIONS FROM REPRESENTATIVE SCHEUER

Cost Savings of In-situ Remediation Technologies

Question 2a: The Energy Department has stated that cleanup costs would be reduced if in-situ remediation technologies are developed. What analysis has been done to support this assumption?

Answer: Cost reductions resulting from in-situ remediation technologies were analyzed for DOE by the Los Alamos National Laboratory (LANL) Energy and Environmental Analysis group. This study employed the Environmental Protection Agency's Cost of Remedial Action (CORA) model for estimating the savings for a combination of in-situ and containment treatment of a low-level waste burial site, as opposed to excavation, treatment, and redisposal. Additionally, the report referenced a study conducted in 1987 by Science Applications International Corporation (SAIC) detailing cost projections for in-situ vitrification. Preliminary results of the SAIC study concluded that costs associated with in-situ treatment would be one-tenth (1/10) that of existing, permitted technologies. However, the LANL EEA analysis results are very preliminary, and according to the CORA model, are subject to an order of magnitude error.

Application of in-situ technologies is being tested and considered for use throughout the DOE complex. The results of the LANL study have been incorporated in DOE's Environmental Restoration and Waste Management 5-Year Plan; and an Integrated Demonstration - an example of in-situ remediation is currently running at Savannah River. This demonstration activity and other technologies

applications are expected to provide additional data, data validation, and results that can be used to narrow the range of uncertainty in the initial analyses. The Savannah River Site uses horizontal wells with in-situ air/steam stripping and in-situ bioremediation of volatile organic compounds (VOC). Over 50 technologies are being demonstrated in a single test bed in the Savannah River Integrated Demonstration including innovative well drilling techniques, several characterization technologies that permit assessment of VOC removal and effects in the soil, as well as the in-situ air stripping and bioremediation.

Further, the DOE Office of Environmental Restoration and Waste Management is now funding LANL to develop the methodology for cost-effectiveness analysis of all research, development, demonstration, testing and evaluation programs, in coordination with the technology developers. The cost-effectiveness methodology is expected to be completed by June 1991, with a preliminary computer model expected by October 1991. Analysis will be conducted on current DOE projects as case studies to develop and validate the cost-effectiveness methodology.

QUESTIONS FROM REPRESENTATIVE SCHEUER

Question 2b: What are DOE's plans to develop this technology and gather the data needed to estimate with accuracy the cost of applying it?

Answer: DOE is developing in-situ technologies to address needs of both environmental restoration and waste operations. Efforts are directed to extend the technological capabilities and to assure reliability of the data generated for subsequent technical, cost, and regulatory analyses. DOE-supported projects advancing in-situ technology development address the following "generic" application areas:

- a. waste containment - using new cementitious grouts for soils and microbial-based "biomembranes" for groundwater;
- b. waste stabilization in soils - based on in-situ vitrification and microbial "fixing" agents;
- c. waste transformation, neutralization and destruction of organics in soils - employing bioremediation;
- d. removal of hazardous metals and organics from the soil - using air stripping, soil flushing, and washing.

A spectrum of applied research, development, demonstration, testing, and evaluation is being conducted on in-situ development projects on these areas as well as in-situ sensor technology development. Usually, DOE laboratories and universities emphasize

the early phase research and industry the later stages. Thus, most bioremediation and in-situ vitrification are done at DOE laboratories. Air stripping is done in an Integrated Demonstration, described below, as a joint DOE site-industry project.

The principal mechanism used for the technology development is the Integrated Demonstration (ID). The Integrated Demonstration is a DOE method to implement proven technology. It is a cost effective process that assembles a group of related technologies to evaluate their performance individually and as a complete "cradle-to-grave" system to remediate a specific waste management and environmental problem. The ID reduces duplication in technology development and permitting and NEPA documentation costs. Thus, it speeds up the process of implementation of new technology. Several Integrated Demonstrations will incorporate in-situ remediation. The most advanced one is directed at removal of chlorinated aliphatic hydrocarbons at the "Saturated Site Volatile Organic Compound" Integrated Demonstration at Savannah River Site.

In-situ technologies for soil and groundwater should significantly reduce restoration costs. There are regulatory barriers to the implementation of in-situ remediation technologies. These stem from the lack of control in the subsurface environment and the legal liabilities of leaving the source term plan. As Integrated Demonstrations progress, DOE will continue to compare costs related

to in-situ technologies versus costs incurred by conventional techniques using existing cost evaluation methodologies.

QUESTIONS FROM REPRESENTATIVE SCHEUER

EM Participation in the Office of Technology Assessment (OTA) Report on Complex Cleanup

Question 3: Mr. Leo Duffy, Director of the Office of Environmental Restoration and Waste Management, has testified that many of the conclusions and recommendations in the recently released OTA report, Complex Cleanup, were an accurate assessment of problems at DOE as of a year ago, but are now significantly outdated. He cited the accomplishments of the Technology Development Program as an example of DOE's current success in addressing facility contamination. Did anyone from the Technology Development Program ever apprise the Office of Technology Assessment of its activities as the report was being developed, or was it ever asked to do so?

Answer: The Department of Energy's (DOE) Office of Environmental Restoration and Waste Management (EM) was requested to review 2 draft OTA documents: "Technical Status Summaries--Soil and Groundwater Remediation" and "Status of Site Assessments--DOE Weapons Complex." EM provided oral and written comments on the reports. In addition, EM staff participated in a one-day workshop sponsored by OTA entitled "Soils and Groundwater Remediation Technologies for DOE Weapons Sites." The workshop discussions and the two reports were used to develop the final OTA report "Complex Cleanup."

The input provided by EM staff, site contractors, and national laboratory employees was not fully represented in the final OTA report. Consequently, the successes EM has accomplished in the 18 months since its inception were not given due attention.

QUESTIONS FROM REPRESENTATIVE SCHEUER

Waste Minimization

Question 4a: What proportion of the Technology Development budget is spent on waste minimization?

Answer: In FY 1991, approximately one third of the Office of Environmental Restoration and Waste Management's Technology Development (OTD) budget was spent on waste minimization. Major efforts include:

- o Environmentally conscious electronics manufacturing; \$6M
- o Minimization of uranium waste during processing at Y-12 Plant; \$15M
- o Department of Energy/Air Force Memorandum of Understanding coordinating research on solvent substitution and other shared problems; and \$1.5M
- o Environmental Management (EM)/Defense Programs (DP) Memorandum of Understanding coordinated research to minimization of waste from 8 waste streams during weapons manufacturing. (DP's funding is \$25M) \$15M

QUESTIONS FROM REPRESENTATIVE SCHEUER

Question 4b: How much waste production is now prevented as a result of these efforts?

Answer: The Office of Environmental Restoration and Waste Management (EM) efforts at preventing waste production have been focused in three major areas: 1) waste minimization program at the Y-12 plant in Oak Ridge; 2) environmentally conscious manufacturing; and 3) research under a DP/EM Memorandum of Agreement to reduce wastes generated as a result of nuclear weapons production. EM initiated its waste minimization program at the Y-12 plant in Oak Ridge, Tennessee. The FY 1990 program called for the minimization of waste produced during the processing of uranium. EM has achieved a number of initial successes in this effort. For example, the use of chlorinated hydrocarbons has been completely eliminated from the Y-12 Plant oralloy process. The use of freon has been completely eliminated from the machining of depleted uranium, resulting in a 95% reduction in the use of freon at the Y-12 Plant. Generation of all low-level radioactive waste has been reduced by 20%. Process modifications presently being demonstrated off the Y-12 production line will reduce waste generation 80% by 1995.

EM's efforts in environmentally conscious manufacturing began in FY 1991. The Kansas City Plant has managed to reduce its consumption of chlorinated hydrocarbons by 60% from the 1988 baseline. The plant was the third highest source of emissions of chlorinated hydrocarbons in the Kansas City area at that time. They are now off the top ten list. The goal of our R&D program

is the complete elimination of chlorinated hydrocarbons from all plant operations.

The research under the DP/EM Memorandum of Agreement (MOA) began in February 1991. The goal of the MOA is to reduce wastes generated as a result of nuclear weapons production. EM hopes that wastes can be reduced 50% by 1995.

